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ABSTRACT

Block scheduling encourages increased comprehensive immersion into subject matter, improved teacher-student relationships, and decreased disciplinary problems. While block scheduling may offer many advantages, moving to a block schedule from conventional scheduling can be a major adjustment for both students and teachers. This guide is intended to ease the problems of change by combining a theoretical background with specific practical and proven tips and tools for implementing a block schedule. It discusses block scheduling in elementary, middle, and high schools, and includes an indepth case study of an exemplary elementary-school curriculum. It explains in detail the three block models-the 4x4 block schedule, the A/B block schedule, and the modified block-and how to select the best model. It offers guidance on curriculum alignment, pacing, and assessment models. It outlines effective instructional strategies for block scheduling, including classroom management and student-centered strategies. And it provides sample models, lessons, activities, forms, evaluations, and surveys for easy implementation. Most of the guide's 18 chapters include history and research, promises and pitfalls, and summary sections. (Contains an index and 215 references.) (WFA)

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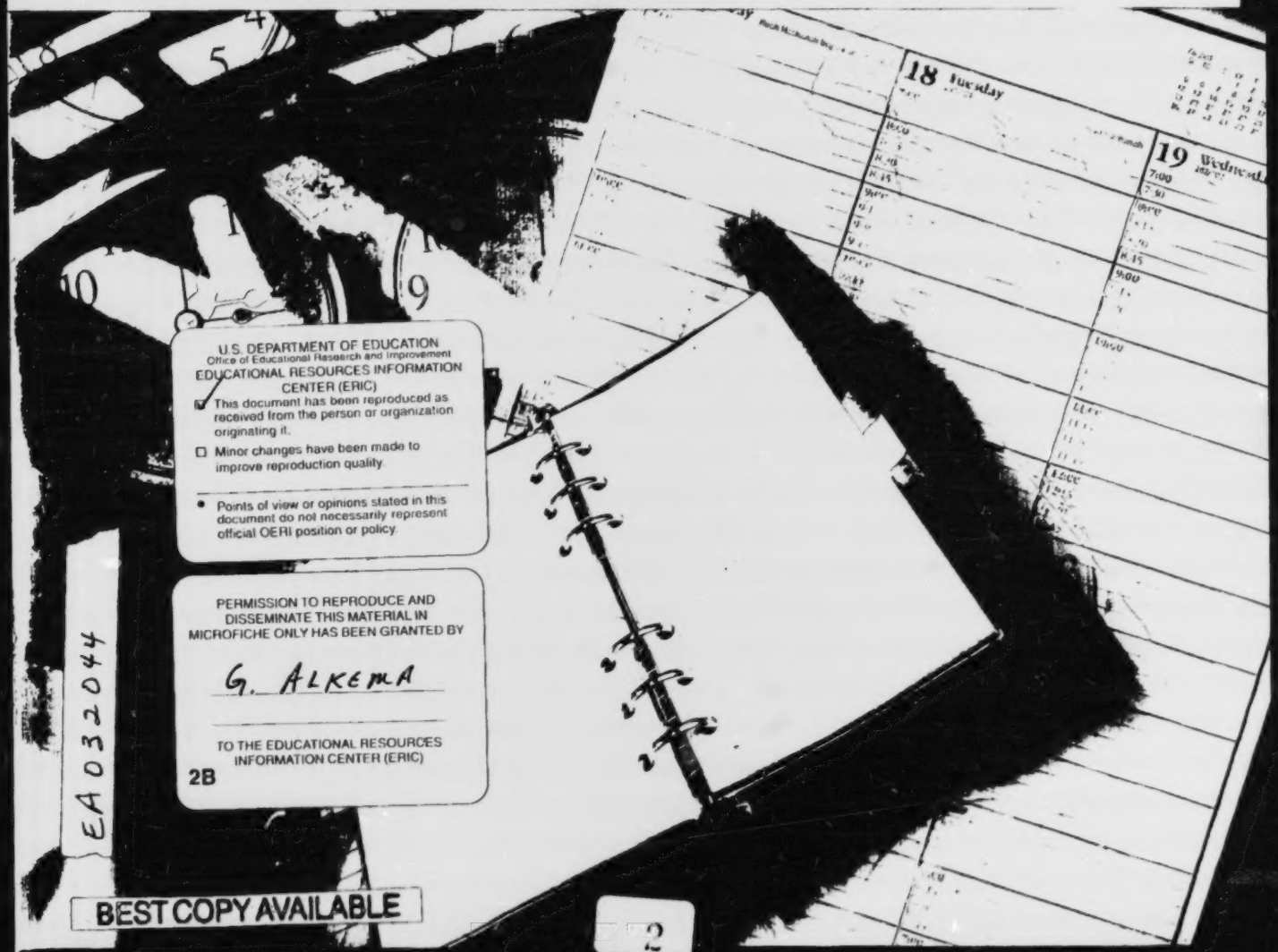

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J. Allen Queen

The BLOCK SCHEDULING HANDBOOK

I dedicate this book to my high school senior English teacher, Mary Shelton Drum of West Lincoln High School. Mrs. Drum was a different teacher from many of my other teachers. She demanded respect, but gave it. She expected excellence, but demonstrated it. She searched for inspiration in her teaching, but inspired. Twenty-two years later, I had the opportunity of working with her as a colleague sharing knowledge and belief in a new way of teaching. This new way was block scheduling. Thanks, Mrs. Drum.

The BLOCK SCHEDULING HANDBOOK

J. Allen Queen

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Companion Website

Educators who have purchased this book will be able to visit Dr. Queen's website, www.blockscheduling.com, to download related materials for staff development with teachers and instructional ideas for students. One section will include detailed, colorful Powerpoint projections for instructional use. Teachers have a forum to share ideas and chat. Related links are also available. The website is updated on a monthly basis and a link allows you to contact Dr. Queen directly. He promises to return your email within 48 hours.

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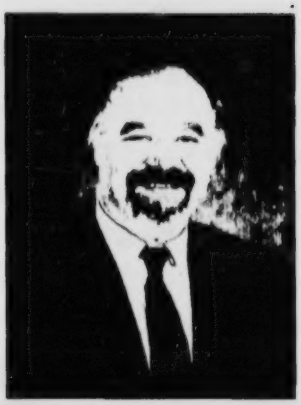
About the Author



J. Allen Queen serves as a major consultant in block scheduling to school boards and school systems throughout the United States, working with them to train teachers, collect data, and evaluate the effectiveness of block scheduling. He is coauthor of *The 4×4 Block Schedule* (1998), many journal articles, and hundreds of presentations to educational groups interested in block scheduling, school discipline, and effective time management for instruction.

He has been a classroom teacher, principal, curriculum specialist, and college administrator. Currently he is Professor and Chair of the Department of Educational Leadership at the University of North Carolina at Charlotte. His Web site can be accessed at www.blockscheduling.com.

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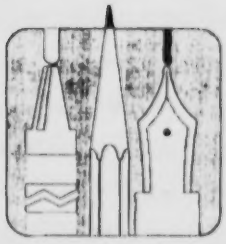

High Schools on the Block

Those of us who have taught for years know that the traditional high school structure has remained fundamentally unchanged for most of the 20th century. Naturally, in our never-ending quest to improve education, some experimentation has taken place. In 1959, Trump proposed eliminating the rigid traditional high school schedule and instituting classes of varying lengths based on the instructional needs of students. The Trump Plan allowed for a science class to meet for a 40-minute lecture, a 100-minute lab, and a 20-minute help session per week, whereas other classes could be short periods of 20 or 30 minutes. With limited success, Trump encouraged teachers to experiment with a variety of instructional strategies in an attempt to provide flexibility in the educational process.

Tradition rather than proven educational success has guided administrators in scheduling classes for students. Even today, in spite of the awareness of problems with the traditional schedule, some of us continue to resist a change in the schedule, choosing a return to the traditional format—claiming failure due to limited training, preparation, time, and resources. In addition, generations of Americans have graduated from high schools requiring the successful completion of a prescribed number of Carnegie units, which are based on accumulated seat time (Canady & Rettig, 1995a). This high school tradition appeared trite when, in 1983, *A Nation at Risk* reported that our students were academically behind their

counterparts from a number of other industrialized nations. In response to the 1983 report, we began to examine alternatives that would result in higher student achievement and started a reform movement to restructure our schools. Block scheduling served as one avenue in this restructuring process.

While the various national education reports of the 1980s addressed the general condition of American education, including secondary schools, a few reports addressed high school exclusively. Ernest Boyer and Theodore Sizer wrote two of the most highly publicized proposals for high school reform.

High School: A Report on Secondary Education in America, written by Ernest Boyer (1983), was prepared for the Carnegie Foundation for the Advancement of Teaching. It was "based on a three-year study in which twenty-five educators collected data at fifteen diverse senior high schools" (Ornstein & Levine, 1989, p. 595). Boyer's proposals for improvement and reform included several themes. One of his main findings was "that high schools, lacking a 'clear and vital' vision of their mission, were unable to formulate 'widely shared common purposes' or 'educational priorities'" (Gutek, 1986, p. 347). Among Boyer's most important recommendations were those dealing with teacher's working conditions. "These recommendations included proposals that high-school teachers should have a daily load of only four regular classes and one small seminar, should have an hour a day for class preparation, and should be exempt from monitoring halls, lunchrooms, and recreation areas" (Ornstein & Levine, 1989, p. 595).

Theodore Sizer's (1984) major work, *Horace's Compromise: The Dilemma of the American High School*, was based partly on school visits he made to 80 high schools. "Sizer, former headmaster of Phillips Academy and former dean of Harvard's Graduate School of Education, created a synthesis that encompassed the liberating tendencies of the 1960s with the emphasis on academic competency of the early 1980s" (Gutek, 1986, p. 348). In his book, a teacher named Horace must choose between "covering" a multitude of low-level skills in the prescribed curriculum and in-depth teaching of important concepts and understandings. To develop in-depth learning, Sizer recommended that the curriculum be divided into four major areas: inquiry and expression, mathematics and science, literature and the arts, and philosophy and history. He also emphasized more active learning and reduced emphasis on what he considered mindless approaches to minimal competency testing. Sizer's particular concern was to eliminate the tacit understanding between students who say, "I will be orderly . . . if you don't push me very hard" and teachers who respond "You play along with my minimal requirements and I will keep them minimal" (Ornstein & Levine, 1989, p. 595). In addition, it is important to note that Sizer acknowledged the complexity of teaching high school. He pointed out that teachers could not effectively teach 150 to 180 students a day and recommended that a team of seven or eight teachers work with groups of about 100 students when teaching the four major curriculum areas he had prescribed (p. 595).

"Of all the reports of the 1980s, *Horace's Compromise* marked the greatest departure from the tendency to mandate more prescribed subjects in the curriculum. Sizer's recommendations were directed at raising expectations and achievement outcomes, but in a more flexible atmosphere" (Gutek, 1986, p. 349). As we move into the 21st century, Sizer's ideas for integrated learning are likely to remain significant since many schools in the United States are successfully teaming teachers to offer students a more interrelated curriculum.

In the 1980s, Mortimer J. Adler published his *Paideia Proposal* (Adler, 1982), which asserted that all students should have access to an intellectually-based curriculum. Adler argued that there exists a general learning that all human beings should possess. "Since American society is a democracy based on political and ethical equality, the same quality of schooling should be provided for all students" (Ornstein & Levine, 1989, p. 211). Adler and his Paideia associates considered the following subject matter as essential: language, literature, fine arts, mathematics, natural sciences, history, geography, and social studies. The subjects were viewed as a framework for developing a collection of intellectual skills necessary for all students. Some of the intellectual skills they wanted to focus on were reading, writing, speaking, listening, and problem solving. When the fundamental skills were coupled with the intellectual skills, a higher level of learning was reached. The *Paideia Proposal* allowed all students the opportunity to study the basics while achieving greater understanding of other ideas through Socratic teaching. In the late 1990s, the proposal reemerged in some schools as a means of teaching higher-order thinking skills and respect for others' opinions and views.

Perhaps the birth of the modern day block schedule began in 1984 when Goodlad argued in *A Place Called School* that the traditional high school did not allow enough time to individualize instruction, extend laboratory work, or provide much-needed remediation and enrichment to our students. He recognized then, as we do now, that an enormous amount of time and energy is wasted by changing classes from six to seven times a day. To be more effective, Goodlad encouraged schools to redesign their schedules into larger blocks of time. Six years later, Carroll (1994) suggested that we change to a format in which students concentrate on one or two subjects and encourage teachers to focus more on individual students. Block scheduling was beginning to take shape.

In 1994, Cawelti argued that by restructuring high schools, we as teachers could bring about fundamental changes in the expectations, content, and learning experiences provided to students. During the same year, we learned that 40% of schools in the United States were using some form of block scheduling. The number continues to grow nationally today with most states having more blocked schools than traditional schools.

In general, block scheduling is based on the idea of organizing a course around one semester in an extended class time of 90 minutes rather than the more typical 50 minutes. Following are the three major formats of block scheduling in use today:

1. *4x4*, four-block, compacted or accelerated model; the daily, four 90-minute periods per semester
2. *A/B*, eight-block, expanded model; the rotating daily, eight 90-minute periods per year
3. *Modified periods* with an array of block-scheduled and traditional classes taught over varying periods of three months, semesters, or the school year

The modified block classes can be scheduled in a variety of ways based on subject content or desired flexibility (Canady & Rettig, 1995a; DiBiase & Queen, 1999). Known as the modified block or the split block, this model is gaining popularity today in both middle and high school settings. While the modified model provides the most flexibility, it is the most difficult to schedule, and many teachers believe that many of the benefits provided by the 4x4 and A/B models are lost.

Teachers who instruct in block-scheduled schools have improved the academic environment for students by increasing the number of courses that can be completed in a four-year period. In the process, graduation rates have increased and discipline problems have declined. Since most students have been limited to four classes each day, lighter student loads can allow for greater immersion in the subject with less time spent changing from one class to another. An improved school climate can result in a more relaxed atmosphere with greater student-teacher rapport. In many cases, the schedule change has become a tool for curriculum improvement (Gerking, 1995). Teachers have learned quickly that both positive and negative results come with any change, and moving to a block schedule is a big adjustment. However, when weighing the advantages and disadvantages to the students, many schools have found that the change is worth the effort.

Educators who have purchased this book can go to my website www.blockscheduling.com (or directly to the site by typing block scheduling on Yahoo) to the section, "Block Scheduling Handbook Materials" and download the PowerPoint, "Introduction to Block Scheduling."

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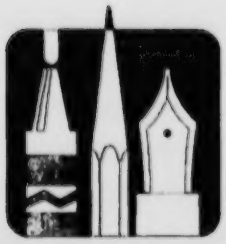


Benefits and Cautions

Block scheduling has advantages and disadvantages that must be considered from the perspectives of teachers, administrators, and most important, students—perspectives that, admittedly, overlap. The benefits to all those involved in the educational system are many; however, the disadvantages must be studied closely before implementation.

BENEFITS OF BLOCK SCHEDULING

One benefit to block scheduling is that students are usually able to take more classes, thereby broadening the scope of their course selection. Under the block schedule, students who may not have been able to take electives in a traditional schedule will be able to take them. Students' attendance in class improves, and they are less likely to show disruptive behavior because of reduced time spent in changing classes. In addition, more students complete advanced-placement courses, and on average, their course grades improve. The design of the block schedule allows students to receive more individual attention.

Teachers have more time to plan and prepare for classes under the block schedule. They become more effective by varying instructional strategies, thereby engaging students to a greater degree. Also, due to the increased length of the classes, more in-depth study of subjects is possible. Experience shows us that more than 70% of teachers go beyond the lecture approach and use interactive instruction (Queen, Algozzine, & Eaddy,

1997). With effective planning, teachers will have to spend less time organizing attendance sheets, receipts, report cards, and other business forms, thereby giving them further opportunities for planning instruction. In fact, some teachers, depending on the subjects, block design, and school size, may have only two course preparations daily. For example, she may teach two sections each of two different courses—say, two sections of advanced placement English and two sections of general English.

Administrators and teachers will be happy to know that block scheduling has a positive effect on school climate and requires less time spent on procedures, routines, and management. Teachers have more instructional time for extended laboratory investigation or classroom experiments. More guided practice and extra time are available for skill enhancement in music, art, and vocational classes. Field trips to locations close to the school may be taken during one period. Of the greatest importance, we know that the longer class period allows more time for interactive instruction using varied instructional strategies, such as cooperative learning, inquiry method, group discussion, concept development, simulations, and seminars, all of which can increase student interest and performance. In numerous studies and classroom observations, 70% to 80% of teachers, students, and parents believe that block scheduling is effective. As fears of school violence continue to grow, most of us believe that block scheduling also has increased school safety.

Students on the block are absent from class fewer times, but they have fewer classes to complete missed assignments. As a result, schools need to establish homework policies and guidelines for missed instruction. Students find they have another chance to remain with their peers if they fail a class, especially on the 4x4 block. If a student fails a class during the fall semester, the class may be repeated during the next semester. This second chance for some students may limit the need for summer school. Principals may find a higher probability for students to remain in school if they can keep pace with their peers to graduate on time.

Discipline is an important consideration in schools and can often be improved under the block schedule. When necessary, administrators can suspend a student for a semester instead of a year (in the 4x4 block) without putting the student behind for a full year. For example, depending on the infraction, a student could be suspended for an entire semester and still earn four credits for the year (Canady & Rettig, 1995a; Gunter, Estes, & Schwab, 1990; Hottenstein, 1998; Siefert & Beck, 1994). Historically, teachers throughout the United States have stated overwhelmingly the positive discipline results of being on the block (Canady & Rettig, 1995a; Queen, 2000).

RESEARCH BASE

Several researchers cite the advantages of the block scheduling in their studies. Day, Ivanov, and Binkley (1996) outline the benefits of a block schedule for science instruction. Day bases these benefits on her experi-

ence as the only science teacher at Center High School in Tennessee. The high school has an enrollment of 200 students and has used block scheduling for five years. The benefits she has found include increased student-teacher interaction, smaller classes, long blocks of instructional time with fewer interruptions per class, time for more in-depth study, and uninterrupted experiments. Also, block scheduling allows students and teachers opportunities to get to know each other better, which helps to keep a positive classroom climate, leading to fewer discipline problems. In addition, the teacher has time to introduce a concept, do an activity to reinforce the concept, and have follow-up activities for closure all in the same period.

Edwards (1995) cites the advantages based on his research at Orange County High School in Virginia where they have been using the 4x4 plan since 1993. Advantages for the teachers include a more manageable schedule by having fewer students at a time, fewer classes for which to prepare, and increased planning time. Advantages for students include fewer classes a day, which gives them fewer subjects to focus on at one time; the opportunity to earn up to eight credits per year; and the chance to repeat any failed courses without falling behind. He also found that grades went up, students completed more courses, and more students enrolled in and passed advanced placement exams.

Huff (1995) reports the advantages of block scheduling as evidenced at Scotland County R-1 High School in Memphis, Missouri. These include the following: (a) teachers have enough time to develop key concepts, (b) there is a greater range of classes for students to select from, (c) students have two evenings to complete assignments, (d) there is an increase in teaching and learning creativity, (e) a variety of teaching techniques can be used in each class meeting, (f) activities are diverse, (g) study halls can be eliminated, (h) new concepts can be applied immediately, and (i) both teachers and students have only four classes to prepare for each day. Huff found that both students and teachers agreed that block scheduling should continue. Seventy-nine percent of the students believed instruction under this schedule was superior to instruction under the traditional schedule.

Shore (1995), the ex-vice principal at Huntington Beach High School in California, cites some of the benefits of block scheduling at her school. These include students receiving personal attention because teachers see fewer students, an allowance for the implementation of a tutorial period before school, smaller classes, and happier students and teachers.

In late August of 2000, I was fortunate to conduct an interview with Dr. Dennis Williams, the former principal of West Mecklenburg High School, and we discussed his experiences with the first 4x4 school in the system when he began the program in 1994. He sited the benefits of implementing the 4x4 block plan. The school has experienced an increase in the number of students on the A and B honor roll and a decrease in the number of failing grades. There was also a decrease in the number of suspensions, both in school and out of school. At the end of the first year, over 90% of the teachers and almost 90% of the students did not want to return to the traditional schedule.

Gerking (1995), a science teacher at Laramie High School in Wyoming, states that on a block schedule, there are not as many contact minutes with the students over the entire semester but that the learning is far more intense and there is time available for group work and cooperative learning. Although not as much material is covered, what is covered is in depth and the important concepts are emphasized with less wasted time. The teachers, students, and parents have indicated that they would not want to return to the traditional schedule.

Picciotto (1996), the revolutionary guru of the San Francisco Urban Plan, compares the traditional schedule and the new block schedule at the Urban School of San Francisco, an independent progressive high school, where he works. The advantages he found include the following: (a) Teachers usually teach three periods and have two different preparation times, (b) teachers see fewer students so they get to know them better, (c) students juggle fewer subjects and can concentrate better on the ones they are taking, (d) the half-day period makes it possible to take field trips and pursue major projects, and (e) the three 70-minute periods allow enough time to do something in depth or to do more than one activity. The disadvantages are fewer homework opportunities because the class meets for only one semester, students' taking four academic classes creates a great deal of intensity, and the longer planning periods can be challenging for novice teachers.

In a study of 4x4 block scheduling at Wasson High School in Colorado Springs, O'Neil (1995) identifies the following advantages: a lower student-to-teacher ratio, a decline in discipline problems, and the creation of a less stressful climate. He concludes that the weaknesses are the teachers' failing to use scheduling effectively, inappropriate instructional strategies for the longer period of time, and the possibility of not as much curriculum being covered.

Wilson (1995), a teacher at Hope High School in Arkansas, states the advantages and concerns experienced with the 4x4-block schedule since its implementation during the 1994-1995 school year. The advantages were that students could earn more credits, the schedule was more flexible, homework was limited to four classes, and more work occurred in the classroom, with the teacher having the time to completely cover a concept before class is over. The concerns included students who transfer in and out of schools.

■ CAUTIONS ABOUT BLOCK SCHEDULING

While the promises for success have been numerous, many pitfalls have been identified. Block scheduling has been criticized for the loss of content retention from one level of a subject to the next and the extensive time required for independent study outside of class. Transfer students from schools on a traditional schedule, the limited number of new electives offered, and the increased overuse of lecture in the classrooms can be problems as well.

The first year on block scheduling is the most challenging for teachers and principals. Many teachers are anxious about the uncertainties associated with teaching in longer blocks of time. Many veteran teachers complain that the first year of block scheduling is much like being a beginning teacher again. As a result, careful planning is required for teachers to successfully adapt to the block schedule. Block scheduling requires teachers to prepare lessons that engage students during longer periods of instructional time. Depending on the subject taught, teachers have varying views and suggestions related to the block schedule.

Foreign language teachers continue to stress the importance of providing course sequencing in the block. These teachers believe that a long period of time between the first and second courses of a sequenced subject can be problematic and could hinder retention and seriously affect achievement. Principals may need to schedule students to take two sequenced courses in one subject area during the year in the block schedule format. Careful planning during the scheduling process will limit the time gap between the first and second courses of specific subjects.

Teachers of performing arts, particularly band instructors, complain that limiting instruction to one semester could hurt the quality of performance. However, many band teachers note improved quality when students with serious musical interests sign up in the program for the entire year. These teachers find increased student participation in music as additional elective opportunities become available.

Advanced placement courses that allow students to earn college credit while in high school present challenges to blocked schools. Problems emerge in the 4x4 design when these courses are offered during the fall semester, but the examination for awarding college credit is not administered until the end of spring semester. Schools using block scheduling have developed unique approaches to assist students in their exam preparation. For example, many schools conduct after-school and Saturday review sessions prior to administering the test. In some schools, students are allowed to take a related elective course during the semester preceding or following the advanced placement course to enhance their knowledge in that area. Advanced placement testing should become available on a semester basis. There are enough schools across the nation using the 4x4 block to warrant these tests each semester.

Many scheduling concerns involve students who transfer schools during the school year. In the beginning of block scheduling when most schools were on the traditional model, transfers were a major concern for some teachers. This is now becoming less of a problem because so many schools are on the block.

Block scheduling has been attacked because of the reduction of total instructional time per class. However, since blocked classes meet a little more than one-half as many times as traditional classes, the total amount of time lost for routine administrative tasks such as taking class attendance can be reduced by as much as 50%. Teachers find that the total time lost is negligible and that coverage of course content is not greatly reduced.

Students in a traditional course meet in 50-minute classes for 180 days, which is a total of 9,000 minutes of instructional time. Students in a block schedule meet in 90-minute classes for 90 days for a total of 8,100 minutes of instructional time. If 10 minutes are lost for administrative functions at the beginning and end of classes, then 1,800 minutes are lost under the traditional schedule (180 days [10 minutes] and 900 minutes are lost under the block (90 days [10 minutes]). Using these numbers, a teacher has 7,200 minutes of instruction under either format: 9,000 – 1,800 = 7,200 minutes under traditional scheduling, and 8,100 – 900 = 7,200 under block scheduling (Hackmann, 1995; Rettig & Canady, 1996; Shortt & Thayer, 1998).

Wasted instructional time becomes a key concern for schools using block scheduling. Instructional time is wasted when teachers fail to use a variety of learning activities and teaching strategies. The lecture method is overused in 30% of blocked classes. This problem can lead to parent and student complaints about the longer class periods becoming boring. Many teachers consider the overuse of lecturing the single most damaging factor to success of the block schedule. This issue will be covered in greater detail later in this section.

It is important to restate that the mere changing of the amount of time students spend in class through block scheduling does not guarantee school success. Unfortunately, it is possible for a school to change scheduling patterns without making appropriate changes in instruction practices. In some cases, modifications in classroom practices appear not to parallel the restructuring initiatives. Appropriate changes in instructional practices and the effective use of class time are the essential keys to the success of block scheduling. One may conclude that the major problem in block scheduling remains either the teacher's use of excessive lecture or the inability to employ more effective, engaging instructional methods in the classroom (Hart, 2000; Queen, Burrell, & McManus, 2000; Queen & Isenhour, 1998b; Schroth & Dixon, 1996; Skrobarcek et al., 1997).

OVERUSING LECTURE CAN DESTROY THE BLOCK SCHEDULE

As previously stated, the major problem in block scheduling today is the overuse of lecture. The lecture has become an "institution" in the American public high school, perhaps even to a greater degree than is found at the university level. When lecture is the major instructional strategy for teaching students, the time for using more appropriate instructional strategies is severely limited. Much of the research on the block schedule shows that teachers are better able to employ a variety of instructional strategies that address the learning needs of students in extended class periods. Some of these instructional strategies are more difficult to complete in a traditional class of 50 to 60 minutes. Unfortunately, the lecture method remains the most used instructional strategy in high school today. With public pressure to increase test scores, it is hard to eliminate

the lecture method, because it is used to facilitate coverage of the curriculum. Educators complain that they have to lecture more because there is limited time to use interactive methods with students given the amount of content to cover in preparation for state-mandated tests. Unfortunately, these teachers have missed a wonderful opportunity not only to have students gain a better understanding of the course content through student-engaging activities but also to have them retain more subject content and consequently perform more effectively on these very same mandated tests. Simply zipping through course content using lecture with passive learners is easier for teachers and students. However, the low retention and application of what is learned is alarming. Again, the block can provide more time for a variety of learning activities. With more time in class and an emphasis on action-oriented strategies, teachers have an opportunity to engage students in activities that allow them to apply content knowledge to real problems, to work together in teams, and to employ modern technology.

A 1997 study by Corley found that veteran classroom teachers (those having 15-20 years of classroom experience) were complacent about their teaching strategies in schools that had positive reputations for preparing students for college. These teachers saw no need to change their instructional approach because they were effective. Conversely, in the same year Adams and Salvaterra (1997) found that some teachers in specific subjects discovered most instructional strategies were easier to implement in a block schedule. The teachers surveyed stated that they used a variety of instructional methods, changing strategies as often as four times per class. Of no surprise was the fact that teachers who had used a variety of instructional strategies during longer class periods also did so during shorter periods. In this study, the researchers found that teachers from some school districts used significantly more instructional strategies than teachers in others. This phenomenon was related directly to the amount and quality of staff development prior to the change to the block schedule and the continued training opportunities that were provided by the school districts.

In another 1997 study, Queen, Algozzine, and Eaddy (1997) found that when appropriate staff development was provided, there was an increase in the variety of teaching strategies used in block scheduling. More specifically, it was discovered that, once prepared, two-thirds of teachers consistently used a variety of interactive instructional strategies. Comparatively, Khazzaka (1997) found that 77% of high school teachers surveyed agreed that they had received adequate staff development and implemented a variety of teaching strategies in the block schedule.

Obviously, if one-third of teachers in block-scheduled schools rely heavily on lecture and do not experiment with different instructional strategies, blocked schools will have greater barriers to success. In addition, many of these same teachers not using interactive methods also waste instructional time in the classroom by not instructing during the last 30 minutes of class. The success of block scheduling will be determined by the

degree to which teachers adopt instructional techniques that take advantage of the extended time blocks to create improved learning opportunities for students (Queen, 2000).

SUMMARY

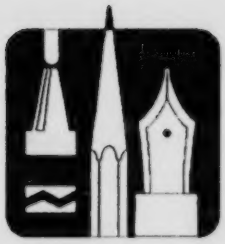
To be a successful teacher in a blocked class, Queen, Algozzine, and Eaddy (1997) concluded that the most important teaching skills for instruction are as follows:

1. The ability to develop a pacing guide for the course in nine-week periods. This includes weekly and daily planning.
2. The ability to use several instructional strategies effectively.
3. The skill to design and maintain an environment that allows for great flexibility and creativity.
4. The desire and skill to be an effective classroom manager.
5. The freedom to share the ownership of teaching and learning with the students.

While it was important that all teachers master these skills, we discovered that beginning teachers needed special attention from mentors and principals (Queen, Algozzine, & Isenhour, 1999).

In reviewing block scheduling, it is apparent that principals and staff development personnel must provide initial and continuous training for teachers to master instructional strategies. Cooperative learning, synectics, Socratic seminars, concept attainment, case methods, inquiry methods, simulations, games, and role-playing strategies are excellent methods for teachers to use in blocked classes. Queen, Burrell, and McManus (2000) identified and reviewed several strategies in *Planning for Instruction: A Year Long Guide*. However, just as a 90-minute lecture is inappropriate, a 90-minute discussion session may be too long. We found that teachers should change activities about every 10 or 15 minutes. This prevents student boredom, elicits class interaction, and encourages teachers to meet the needs of diverse learners. Instruction in these extended periods should begin with a review, include various activities, and conclude with an adequate summary. Suggested instructional approaches for teaching in the block are presented in detail in Part III of this book. But before we focus on the instructional strategies, it is important to review some basic information on growth and development. Visit my website and download the material, Proper Ways to Use the Lecture Method and Related Materials.

THREE



Developmental Aspects of Growth and Behavior

Regardless of scheduling, teachers should understand the fundamental principles of child growth and development so that they can effectively instruct students. We know that children move from an immature and less complex and skilled dependent state to a mature and more complex and skilled independent condition. This process involves a series of invariant stages of physical, intellectual, and personal development. By understanding the stages of development that children invariably move through, teachers know what to expect of children, what and how to instruct, and how to communicate with children based on their stage of development.

Although part of the education and training to become a teacher focuses on these stages of development, it is imperative to keep these stages in mind when designing instruction. Without this knowledge, effective instruction is difficult. The goal of this chapter is to refresh understanding and give an overview of the various developmental stages.

PHYSICAL DEVELOPMENT FROM EARLY CHILDHOOD THROUGH ADOLESCENCE

We only need to watch young children for a short time to see that they tend to be unsteady. This instability is caused by several factors in their physical development. Children in the early childhood stage have a high center of gravity because their heads are out of proportion to their bodies, and their abdomens protrude, which makes balancing difficult. Gaining control over their motor activities is their biggest achievement, during which they also begin to favor the right or left side of the body. As their dexterity improves, children learn to perform fine motor activities, such as tying shoelaces and printing letters of the alphabet. Their ability to jump, run, and walk also improves significantly by the end of the preschool period.

By the time most children reach school age, they have already learned many skills such as buttoning and zipping pants and jackets, buckling belts, cutting with scissors, and coloring within borders. In addition, children print letters and words with greater accuracy. After the seventh year, most children continuously improve the quality of their fine and gross motor skills, but learn few completely new basic capabilities.

Through the primary years children experience comparatively small alterations in their weight and height. Until children reach age nine, boys are generally only slightly heavier and taller than girls. During the early elementary years, children need frequent exercise to accommodate skeletal growth and muscular development and to improve their physical skills. By the age of nine, children begin to participate in complex activities, such as playing musical instruments or constructing models.

From their 8th through 10th years, both sexes are similar in size. Although boys and girls are similar in size at the beginning of fourth grade, by the end of the year, many girls have begun to gain height and weight over boys. The rapid growth of their arms and legs, combined with the slower development of their torsos, causes girls to temporarily appear ungainly and lose a degree of strength and coordination. Most early-maturing females rapidly regain lost ground. By the end of fifth grade or the beginning of sixth grade, they are generally taller and heavier than most boys of the same age. By this point, many girls have reached the size that they remain until puberty.

With the onset of female menstruation at approximately age 13 and male ejaculation between 13 and 16 years, girls and boys enter puberty, a time of particularly significant and substantial changes. The order in which these changes occur is basically the same for each person, but the rate at which females and males mature can vary widely. Some adolescents may fully mature in as little as 18 months from onset, while others may require five or six years. During this period, almost every organ and system in the body are subject to change and stress.

Puberty is a particularly difficult time for children for many reasons. Their bodies change drastically in relatively short periods of time, making

them quite self-conscious; size, muscular development, amount and location of hair, and body proportions are all changed during this period. Since they are experiencing this stage at different rates, additional stress is placed on these adolescents. For those who experience puberty early, the notoriety caused by their advanced development is confusing and generally unwelcome. But as they successfully work through these changes, awkward self-consciousness diminishes and confidence improves. Those who undergo puberty "late" may experience even greater stress. An apparent lack of physical maturity can cause self-doubt, loss of self-esteem, and withdrawal from involvement with others. These problems can carry over into adulthood.

Cognitive Growth

Arnold Gesell notably achieved insight into the progressive nature of child development. Gesell (1971) established a center for research into child development at Yale University, where he worked on the premise that children's growth and development occur in an unvarying sequence within strict boundaries of time. Although his ideas were later found to be inadequate in explaining the true nature of development, his fundamental principle that children move through several phases of reorganization during which they develop new ways of understanding the world has been generally accepted.

While Gesell worked at Yale, psychologist and epistemologist Jean Piaget (1954) quietly explored the intellectual development of his children in Switzerland. His discoveries and the work that followed have become the basis of cognitive science in the fields of psychology and education. Piaget concluded that cognitive growth occurs in specific developmental stages, during which significant differences in the nature and substance of intelligence are developed over time. Piaget saw these differences as real transformations of consciousness.

Based on extensive observations, Piaget (1954) defined several stages of cognitive development. He described from three to six stages of development with several substages (see Table 3.1).

Characteristics of Piaget's Stages of Cognitive Development

Piaget (1954) established a general time frame for the onset of the stages of cognitive development. From birth to two years of age, a child is in the sensori-motor stage of development. The period of preoperational thought is active from the second year until approximately the seventh year. This is followed by the stage of concrete operations, which generally appears by the age of seven and continues through the 11th year. The onset of formal operations, the fourth stage, occurs sometime between the 11th and 16th birthdays.

Piaget (1954) determined that the onset of each stage is signaled by a major shift in intellectual activity from the preceding stage of develop-

Table 3.1. Piaget's Cognitive Stages

Cognitive Stages	*Ages*	*Characteristics*
Formal Operations	11 to adult	• Cognitive structures mature to the adult level • Capacity to engage all categories and classes of problems: the verbal abstraction, the hypothetical, and consideration of past and future conditions • Ability to evaluate a logical argument separate from its content
Concrete Operations	7 to 11 years	• Logical examination of the observable relationships between events, objects, and people • Involves the development of the cognitive structures of seriation and classification • Expression of a strong tendency to organize and apply strict rules to activities undertaken.
Preoperational	2 to 7 years	• Not restricted to immediate environment Expansion of use of mental images Application and understanding of vocabulary expands • Intuitive thought defines preoperational thought
Sensori-motor	0 to 2 years	• Period of simple reflexes • Restricted to immediate experience • Events are uninhibited by sight and feeling • Children build first cognitive structures

ment. Although the beginning of each stage varies for each individual, the sequence of the stages does not change. A child must navigate through the succession of stages; he or she cannot intentionally avoid or miss a stage through superior cognitive attributes. Piaget noted that although definable intellectual activities describe each period, mixing of capabilities from other stages, especially those from stages just experienced, would occur. In addition, as children age, there is an increasing variation in the age at which children begin a stage, with the onset of formal operations in adolescents subject to the greatest age variation. But before examining the four stages of development further, let us look at the ideas that describe the cognitive processes responsible for the changes within those stages.

Schemata and the Process of Assimilation, Accommodation, and Equilibration

In Piaget's (1969b) scheme of cognitive development, assimilation and accommodation are the ways children integrate new experiences into cognitive structures called *schemata* or schemes. According to Piaget, "A scheme is the structure or organization of actions as they are transferred or

generalized by repetition in similar or analogous circumstances" (p. 4). These structures develop from birth, at which time they are simple and undifferentiating. As a child develops and is more able to differentiate among stimuli, the number of schemata grows by absorbing additional relevant material that resulted from encounters with the environment. At major periods of transformation, schemata undergo significant changes that allow a child to deal competently with more complex problems.

The process of assimilation and accommodation is unending, and it reflects people's continuous interaction with an infinite number of stimuli. The process is "a constant filtering of input and modification of internal schemes to fit reality" (Piaget, 1969b, p. 6). Schemata expand as they encounter stimuli that fit into recognizable patterns. A change in the schemata may occur, however, when a child cannot assimilate an experience into the established structure. If the experience cannot be assimilated, then two alternatives are available to the child: (a) The insufficient schemata can be adjusted to accommodate the new material, or (b) a completely new structure can be established to accommodate the material.

The process of assimilation and accommodation (Piaget, 1969b) is the basis for cognitive growth and development that occurs during the life of the individual. Yet the process would be unworkable if the comparative quantities of assimilation and accommodation were not balanced. A person who assimilates everything would have too few schemata and be unable to differentiate experiences. Conversely, a person who accommodates experiences excessively would have too many schemata and would find too few commonalties to generalize to the broader world of experience. This balancing process is called *equilibration*. It is a process to which the engaging intellect is constantly drawn. Equilibrium must be sustained if the intellect is to develop effectively.

The Sensori-Motor Period

From birth through two years of age, children move through what Piaget (1969b) has called the sensori-motor period, which consists of six substages. During this period, children move from a period of simple reflexes to a period in which representation of unseen objects readily occurs. Within these first two years, children are restricted to immediate experience. Without any previous experience, children of this age group have no basis on which to build categories for organizing reality; rather, they experience events uninhibited through sight and feeling.

One of the most important events that a Stage 1 child experiences during the early months of life is the constant appearance and disappearance of familiar objects. From this activity, the child builds cognitive structures, such as object permanence, which are essential to continued mental development. Piaget (1969b) says that during the sensori-motor period,

> The system of sensori-motor schemes of assimilation culminates in a kind of logic of action involving the establishment of relation-

> ships and correspondences and classification of schemes; in short, structures of ordering and assembling that constitute a substructure for the future operations of thought. But sensori-motor intelligence has an equally important result as regards the structuring of the subject's universe, however limited it may be at this practical level. It organizes reality by constructing the broad categories of action that are the schemes of the permanent object, space, time, and causality, substructures of the notions that will later correspond to them. (p. 13)

Adults who restrict or deny a child strong visual experiences during this period can cause deficits in the development of important cognitive structures. An environment filled with a variety of visual and reacting stimuli provides the most supportive conditions for developing a child's intellectual capabilities. An environment without appropriate stimuli can result in serious delays in a child's cognitive development that may not be easily corrected.

The Period of Preoperational Thought

The second stage of a child's development is called the period of preoperational thought (Piaget, 1969b). To enter this stage, a child undergoes a major intellectual transformation. No longer restricted to their immediate environment, children expand on the use of the mental images that they began to develop during the previous stage. They quickly expand their capacity to store information, such as words and the implicit rules of language. During this period, children's application and understanding of vocabulary increase substantially. At two years of age, the average child can use a few hundred words, but by the age of five, that same child may be using over 2,000 words. This major advance in language capability is a distinguishing characteristic of intellectual development. Piaget (1969b) says this about the acquisition of language:

> This has three consequences essential to mental development: (1) the possibility of verbal exchange with other persons, which heralds the onset of the socialization of action; (2) the internalization of words, i.e., the appearance of thought itself, supported by internal language and a system of signs; last and most important, (3) the internalization of action of such, which from now on, rather than being purely perceptual and motor as it has been, heretofore, can represent itself intuitively by means of pictures and "mental experiments" (p. 17).

The underlying mode of thought during Stage 2 is intuitive. During this period, children are experimenters, explorers, and imitators. They are unconcerned about the exactness of their pronouncements. Their use of sounds and language is often inventive and unique. Another aspect of speech during this period is that it is self-centered; children seem to be

talking "at" rather than "with" others. To stimulate their language growth, children need a verbally rich environment. Denying children the use of their language faculty can result in developmental delays that may be very difficult to correct.

Piaget (1969b) has observed that preoperational children's use of intuitive thinking often causes them to misinterpret reality. A child at this stage is generally unable to determine which container holds more water—a tall, narrow beaker or a short, wide one. Often a child's response to this problem is that the taller container holds more water simply because it appears so. According to Piaget, it would do no good to explain to a child at this stage why each container holds the same amount since the child is intellectually unable to process this information. Piaget also indicates that Stage 2 children have difficulties with reversible relationships. For example, Jennifer may understand that Matt is her brother, but she may not understand that she is Matt's sister. Regardless of its apparent lack of logic, the intuitive approach is powerful because it provides a way to learn language quickly and solve problems in imaginative ways.

The Period of Concrete Operations

The third stage of Piaget's (1969b) theory of child development is the period of concrete operations. Once again, children experience an intellectual revolution; progressing from the free-form thinking of the preoperational stage, they now logically examine the operative relationships among events, objects and people. Of operations during this period, Piaget says,

> The operations, such as the union of two classes or the addition of two numbers, are actions characterized by their very great generality since the acts of uniting, arranging in order, etc., enter into all coordinations of particular actions. They are also reversible (the opposite of uniting is separating, the opposite of adding is subtracting, etc.). Furthermore, they are never isolated but always capable of being coordinated into overall systems (for instance, a classification, the sequence of numbers, etc.). Finally they are not peculiar to a given individual; they are common to all individuals on the same mental level (pp. 96-97).

Unlike children in the intuitive state, Stage 3 children are not limited to understanding through perception. Children in concrete operations are able to focus their perceptions and to understand concrete transformations that events or objects undergo. They can now reverse operations. Communications also become less egocentric; children begin to talk with rather than at others. Language becomes functional and purposeful and begins to reflect the child's basic social nature. Piaget (1969b) also found that children in the concrete operations stage develop the cognitive abilities of seriation and classification. With this improvement, children's concepts of space, time, speed, and causality improve dramatically.

The development of logical operations and the associated capabilities of reversibility and classification allow children to solve problems more effectively and with more confidence than during the previous period. But the logic requires real and observable objects. Children at this stage still have great difficulty with verbal or hypothetical objects. Therefore, Stage 3 children are very literal-minded; they interpret situations concretely, failing to understand abstractions. Children presented with an abstract idea will convert the abstraction into a concrete event relevant to their experiences. A child will have a difficult time solving a problem presented in abstract verbal terms but will be able to apply logic to the same problem if it is presented in the form of real, observable objects.

During this period, children express a strong tendency to organize and apply strict rules to activities they undertake. The concrete operational child is often more concerned with establishing rules for an activity than with the activity itself. Working out the functional relationship among various elements in an activity is a focal point during the third stage of development. Once children establish relationships and rules for action, they have a particularly difficult time modifying their ideas during this period. They see things distinctly—things are or they are not; subtleties or shades of gray are not acceptable. Altering the rules of a game is a difficult undertaking for children in this category of intellectual development.

Unless children who are operating concretely are offered direct experiences, preferably hands-on, their learning will be inefficient. To support cognitive growth during this time, practical skills such as such as organizing, constructing, classifying, sorting, counting, and arranging should be taught.

The Period of Formal Operations

According to Piaget (1969b) formal operations is the fourth and final stage of intellectual development. During this period, the adolescent's cognitive structures mature to the adult level. Piaget predicts that no additional structural improvements will occur beyond the period of formal operations, although the efficiency and reach of those structures can be expected to improve during the course of adulthood.

> The great novelty of this stage is that by means of a differentiation of form and content the subject becomes capable of reasoning correctly about propositions he does not believe, or at least not yet; that is propositions that he considers pure hypotheses. He becomes capable of drawing the necessary conclusions from truths that are merely possible, which constitutes the beginning of hypothetical-deductive or formal thought (p. 132).

Logical operations, the onset of which began during the concrete operational period, are brought to their full development during Stage 4. This final period of cognitive development allows a considerably broader range

of logical applications to problem solving than the previous period did. During the period of concrete operations, a child was limited to applying logic to the solution of tangible problems as they occurred; he or she did not permit projection into the future or consideration of hypothetical situations. The child who has achieved formal operations, however, has the capacity to engage all categories and classes of problems. The verbal abstraction, the hypothetical, and consideration of past and future conditions are all subject to the power of the logic of formal operations.

The adolescent operating in formal operations can employ several strategies simultaneously in solving problems. Understanding the concept of causation, using scientific reasoning to approach a problem, and building and testing hypotheses are all hallmarks of the fourth stage of Piaget's theory. In addition, adolescents are able to consider problems involving a combination of several variables rather than focusing on one aspect of a problem as they did during the concrete period. They are also able to undertake complex verbal problems. Problems involving proportion and conservation of movement can also be solved with their advanced logic.

For the first time, a child can separate personal perception from objective reality. The result is the ability to evaluate a logical argument separate from its content. The child in concrete operations was restricted to dealing with the world according to personal perception; thus, a child would be unable to consider a problem involving yellow snow, for example. The more advanced child, however, is able to deal with such a hypothetical condition and, in fact, derive a logical and valid argument not dependent on the observable reality of white snow. As in the previous stages of development, formal operations evolve as a direct result of those intellectual abilities developed in preceding stages. With the transformations that occur from one stage to another, cognitive structures are continuously subject to structural changes. The assimilation, accommodation, and equilibration processes are constantly at work from the sensori-motor period through the period of formal operations.

Cognitive Theory and Block Instruction

According to cognitive theory, children's development is marked by periods when they are particularly sensitive and responsive to outside influences. However, children are not blank slates on which teachers compose whatever they desire. Children, who have inherent dispositions and tendencies and are subject to their external environments, develop and grow intellectually in an invariable sequence form birth through adolescence and beyond. To teach effectively, teachers should be aware of the materials and approaches most appropriate for a child's readiness to learn. Cognitive theory provides insights and guidance into these issues.

Piaget (1969b) suggested that children's cognitive structures should be carefully considered when presenting instructional materials. According to Piaget, intellectual capabilities are not set at birth; they are ultimately dependent on the appropriateness of the activities and the environment in

which a child develops. In preparing their lessons, teachers should pay close attention to the children's intellectual stages so that they can develop activities that stimulate cognitive development. If teachers do not consider the children's cognitive structure, the classroom experience will be less effective than it could be. A carefully tailored classroom experience produces cognitive growth and a successful child.

We tend to think that accelerating intellectual growth is always a positive step and one that teachers should pursue. However, attempting to push children beyond the level they are currently experiencing may serve only to frustrate a child. Children's intellectual accomplishments can be strengthened within each period of development. This improves a child's intellectual capacity and broadens the foundation for future growth. Expanding on learning opportunities that are relevant to each child's cognitive level improves learning conditions in the classroom by minimizing frustrating conditions for children.

PERSONALITY DEVELOPMENT

The development of personality coincides with physical and intellectual developments. Discussing the personal-psychological character of development helps us achieve greater depth in our understanding of the total child. The development of personality follows a sequence of interdependent periods that generally correspond to the stages of cognitive development. Satisfaction of needs during one stage determines the child's ability to progress to the next stage. When needs are not met, children have difficulty making the transition to the following stage and may be delayed or even prevented from continuing their personal advance to more mature stages of development.

As Jean Piaget's theories describe the area of cognitive development, Erik Erikson's (1980) ideas have become the basis for much of our understanding of personality development in children and adolescents. (See Table 3.2 for a comparison of Piaget's cognitive stages and Erikson's personality stages.) Erikson's (1980) ideas about human development arose out of his work in Freudian psychology. Sigmund Freud, originator of the concepts of the id, the ego, and the superego, believed that to understand adult personality and behavior, the experiences and relationships the adult had as a child must be analyzed. Within these experiences and relationships, Freud saw the basis for later emotional development. As the psychologist investigated child and adult behavior, he recognized that children and adults move through a series of emotional stages from birth to adulthood. Freud described five such stages: (a) the oral stage, from birth to 18 months; (b) the anal stage, from 18 months to three years; (c) the phallic stage, from three to seven years; (d) the period of latency, from seven to 12 years; and (e) the genital period, from age 12 through adulthood.

Table 3.2. A Comparison of Piaget and Erikson

Piaget's Cognitive Stages	*Age and Erikson's Personality Stages*	
	Ages 13 – 18	Identity vs. Diffusion
	Age 12	Industry vs. Inferiority
Concrete Operations	Ages 8 – 11	Industry vs. Inferiority
Preoperational	Age 7	Industry vs. Inferiority
	Ages 4 – 6	Inferiority vs. Guilt
	Age 3	Autonomy vs. Shame
Sensori-Motor	Age 2	Autonomy vs. Shame
	Age 1.5	Formal Operations
	Birth – 18 months	Trust vs. Mistrust

Freud found that as children undergo this sequence of emotional transformation, their experiences have a profound effect on the formation of adult personality. Specific areas of personality that are particularly vulnerable to alteration define these transformative periods. Based on these periods of change, Erikson (1980) developed eight stages that further define the contents and mechanisms operating in the maturing human being. In this section, the first five stages, from birth through adolescence, will be examined (see Table 3.3). For a comparison with Piaget's stages of cognitive development and Freud's stages of emotional development see Table 3.4.

Erikson's Stages of Personality Development

The first of Erikson's (1980) stages is concerned with the development of trust and mistrust. Erikson has defined trust as "what is commonly implied in reasonable trustfulness as far as others are concerned." He defines mistrust as characterizing "individuals who withdraw into themselves in particular ways when they are at odds with themselves or with others" (pp. 57-58). The stage of *trust versus mistrust* occurs during the infant stage, from birth to 18 months. Erikson has determined that during this time children develop varying degrees of trust and mistrust. To successfully establish a solid foundation on which to build a balanced personality, he believes that parents must provide a highly supportive and nurturing environment. The quality of attention and degree to which a parent attends to a child during this period will have a profound effect on the degree to which the maturing child expresses trust and dependability. When parents provide consistent care and affection during interactive periods, a child will be prepared to begin the next level of personal development successfully.

During the second stage of Erikson's (1980) theory, which he called the period of *autonomy versus shame and doubt*, children continue their emotional development. Between the age of 18 months and three years, chil-

Table 3.3. Birth Through Adolescence According to Erikson

Stage of Development	*Approximate Age*	*Characteristics*
V. Identity vs. Identity Diffusion	12 to 18	• Uses logic to solve hypothetical problems • Undergoes significant body system alterations, resulting in reproductive capability • Decisions made on objective evidence • Ideas of others considered less egocentrically • Capable of empathy • Need to improve things • Requires responsibility for growth
IV. Industry vs. Inferiority	6 to 12	• Focus turns to friends and school • Form social alliances reflecting growing interest in other people and in things outside family • Important to encourage children to actively explore the world, to test themselves, and to work hard to achieve goals
III. Initiative vs. Guilt	3 to 6	• Begin to explore sexual identity and identify with appropriate male and female models • Important to reinforce identity at this point, to establish a sense of self
II. Autonomy vs. Shame	18 months to 3 years	• Conflicted by attempts to gain a degree of independence and competence • Begin to express a strong sense of self • Intensely investigates environment • Should be encouraged to express themselves verbally
I. Trust vs. Mistrust	Birth to 18 months	• Develop varying degrees of trust and mistrust • Parents must provide supportive and nurturing environment • Quality of care has profound effect on the degree to which the maturing child expresses trust and dependability

Table 3.4. A Comparison of Freud and Erikson

Ages	*Freud*	*Erikson*
12 to 18 years	Genital	Identity-Identity Diffusion
7 to 12 years	Latency	Industry-Inferiority
3 to 7 years	Phallic	Initiative-Guilt
18 months to 3 years	Anal	Autonomy-Shame
Birth to 18 months	Oral	Trust-Mistrust

dren experience the conflict created by their attempts to gain a degree of competence and independence from their parents. Erikson describes the significance of this period:

> The overall significance of this stage lies in the maturation of the muscle system, the consequent ability (and doubly felt inability) to coordinate a number of highly conflicting action patterns such as "holding on" and "letting go," and the enormous value with which the still highly dependent child begins to endow his autonomous will. (p. 68)

While seeking independence, children begin to express a strong sense of self and engage in a period of intense investigation of their environment. At this stage, adults who prevent a child from fully developing personal autonomy can easily frustrate him or her. Therefore, adults at this stage should support a child's attempts to explore the world. Also at this time, children will begin to express themselves verbally. As noted in the discussion on cognitive development, vocabulary increases dramatically during this period; much practice is required to accomplish this. To increase the probability of success during this stage of development, children should be encouraged to express themselves verbally. Constantly correcting word pronunciations and grammatical forms will often hinder a child's development. Rather than inhibiting a child at this time by overcorrection, Erikson (1980) suggests that adults model the speech desired. Accordingly, adults should avoid speaking in unnatural ways, such as baby talk, which will only confuse a child's efforts.

There is a clear relationship between the way parents behave during this period and a child's self-confidence and sense of autonomy. The most productive patterns are those in which parents provide an imaginative environment that stimulates speech and exploration. Supportive parents constantly involve their children in stimulating activities during which they question and elicit a child's ideas. This indirect form of teaching, in combination with the experience of self-initiative, establishes the basis for a child's feeling of competence. As children learn independence and begin to see themselves as active and effective participants in the management of

their environment, they establish a strong foundation on which to build a healthy and maturing personality.

Unfortunately, a child will not always successfully navigate through the demands of this period. Sometimes children develop a sense of shame because of their failure to develop independence effectively. When parents or other adults fail to provide stimulating experiences, restrict activity too narrowly, ignore the need for attention and love, and deny or harshly criticize expression, children will not advance and may be prevented from developing a productive and well-balanced personality. Their sense of shame will limit their ability to engage life directly and confidently.

The third stage of Erikson's (1980) theory is concerned with *initiative versus guilt*. Children develop these personal characteristics during the third through sixth years. This period especially affects a child's gender identity. While in the previous stage of development children generally began to explore sexual identity, they now begin to identify with appropriate male and female models and behave in accordance with what they see. It is especially important to reinforce their sexual identity at this point so that they will establish the sense of self needed to successfully advance to the next stage of development.

Children naturally possess feelings of inferiority at this time. To avoid establishing a sense of guilt about their desires and inabilities, they should be assured that they will eventually be able to do what they see adults doing. Taking personal initiative is inherently connected to children's personal identity and overcoming this sense of inferiority. According to Erikson (1980), a child possesses the capacity to overcome the difficulties of this stage as the child

> (1) learns to move around more freely and more violently and therefore establishes a wider and, so it seems to him, an unlimited radius of goal; [as] (2) his sense of language becomes perfected to the point where he understands and can ask about many things just enough to misunderstand them thoroughly; and (3)[as] both language and locomotion permit him to expand his imagination over so many things that he cannot avoid frightening himself with what he himself dreamed and thought up. (p. 78)

When children have been successfully weaned of their sole reliance on adults for meeting their needs, adults will have been successful in supporting them in the development of their personal identities. As children express independence by effectively meeting the demands of various situations, they develop greater confidence in their own competence and enhance their growing sense of self.

During Erikson's (1980) fourth stage, *industry versus inferiority* are the primary issues. From approximately six until 12 years of age, children turn away from their focus on parents to a more generalized focus on the world in which they find themselves, most notably with friends and at school. During this period, children learn to communicate with others in an

increasingly less ego-centered approach. By behaving in this manner, children free themselves from the isolation and control related to their total dependence on parents. They become more socially oriented, forming social alliances that reflect their growing interests in other people and in things outside their family and home. During this time, they exert enormous amounts of energy trying to perfect their skills in dealing with the demands of the world. Erikson describes the focus of this period:

> While all children need their hours and days of make-believe in games, they all, sooner or later, become dissatisfied and disgruntled without a sense of being useful, without a sense of being able to make things and make them well and even perfectly: this is what I call a sense of industry. Without this, the best-entertained child soon acts exploited. It is as if he knows and his society knows that now that he is psychologically a parent, he must begin to be somewhat of a worker and potential provider before becoming a biological parent. . . . As he once untiringly strove to walk well and to throw things away well, he now wants to make things well. He develops the pleasure of work completion by steady attention and preserving diligence. (p. 91)

During this period of developing greater self-sufficiency and independence, children are particularly stable emotionally. Also during this period, children experience the concrete operational period, when the world is seen as stable and predictable and shades of gray are unwelcome intrusions into their ideas about the world. As children learn new social, practical, and academic skills, they enhance their sense of industry. When they fail to do so, they develop a sense of inferiority that further limits their ability to develop personal competence. At this time, it is important to encourage children to actively engage the world, to explore and test themselves, and to work hard to achieve goals. With success comes the knowledge that their efforts have results. Children who fail to develop a sense of industry based on their skills in achieving goals will not achieve independence. Their sense of inferiority will diminish their capacity to meet the demands of the world.

Development of industry during this period occurs to a large extent where children spend most of their active time—in school and among friends. The experience in school is particularly important to children's development of self-confidence and skill mastery. Within the classroom, children can be given the opportunity to learn many new skills that will result in a growing ability to solve problems competently. With this accomplishment, the promise of adulthood made in an earlier age comes closer to reality.

The final period of personal development relevant to this topic occurs between the ages of 12 and 18 years. According to Erikson (1980), the formation of *identity*, or the failure of that formation, which he calls *identity diffusion*, is the main issue of the adolescent age. During this period, chil-

dren undergo their most tumultuous changes, often causing them to behave in aggressive, confused, and unpredictable ways. It is a time of significant body system alterations that result in physically mature individuals capable of reproduction. But it is also a time when they begin to see the contradictions of the world more clearly, further increasing their emotional instability.

> But in puberty and adolescence all sameness and continuities relied on earlier are questioned again because of a rapidity of body growth, which equals that of early childhood, and because of the entirely new addition of physical genital maturity. The growing and developing young people, faced with the psychological revolution within them, are now primarily concerned with attempts at consolidating their social roles. . . . In their search for a new sense of continuity and sameness, some adolescents have to re-fight many of the crises of earlier years, and they are never ready to install lasting idols and ideals as guardians of a final identity. (p. 94)

Cognitively, adolescents leave the world of predictability where right and wrong are certain and where their skills have an immediate and direct effect on the environment in which they operate. As adolescents they begin to evaluate conditions, comparing what they see with what might be. They begin to separate the world around them from their own desires and perceptions. Objective reality begins to assert itself in the adolescent mind. They begin to understand and use metaphorical descriptions. The advancing adolescent considers the ideas and positions of others less egocentrically. They sometimes are able to put themselves in another's position, developing empathy and a need to change things.

Alternatively, with greater uncertainty and a heightened sense of self, children become particularly self-conscious as they advance into adolescence. In this state, they try to fit in by conforming to peer groups. They can be excessively egotistic, demand attention, and look for as many ways to conform as is possible. Their world becomes relativistic, where behavior is tested against rationalizations of their own and of their peers. Where they previously conformed to authorities' wishes, they may now rebel.

The effect of this change and uncertainty leads to an adolescent identity crisis. The successful evolution of personality during this period depends on the adolescent's ability to meet the demands of this stage of personal development successfully. If an adolescent overcomes the difficulties associated with this period, it is likely that he or she will have established a strong foundation for advancement into adulthood. If, on the other hand, a person has succumbed to these conflicts, the personality will not solidify. Instead, it will remain uncertain, diffuse, and alienated with little sense of purpose or satisfaction. To avoid this failure, Erikson (1980) strongly suggests that adolescents be given every opportunity to develop a sense of responsibility for themselves and others. Real, self-directed

experience, working to meet the needs of others, and satisfying the demands of society will help an adolescent to develop purpose and a strong identity on which to build a mature adulthood.

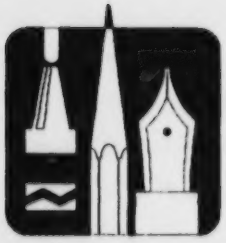
Implications of Erikson's Theory for Block Instruction

It is important to stress that a knowledge of the theories presented in this chapter is necessary for all teachers, regardless of the schedule their school uses. However, we now focus on these theories as applied specifically to block instruction. The scope of Erikson's theory permits us to see the needs and potential problems experienced by all children in their development toward adulthood. Each stage of development requires that adults provide the necessary environment and tools for children to succeed in overcoming the obstacles of the period in which they are operating. Children's behaviors and abilities expressed at each stage of development depend on the degree to which they successfully managed the issues of the preceding stage. If children fail to overcome difficulties or to learn the skills necessary to fulfill their growing responsibilities at any stage, problems will be compounded in each successive stage. It is important to make certain our instructional effort is effective and our knowledge and sensitivity to the transformations of childhood are substantial.

When Erikson's ideas about personality development are considered in conjunction with Piaget's theories about intellectual transformation, teachers have at their disposal a powerful perspective from which to view the conditions of childhood and adolescence. Teachers should evaluate their students from this theoretical perspective to determine children's readiness to learn. Teachers will have success in the classroom when they apply these ideas effectively. Dealing with a child's intellectual capacity as if it exists in isolation, separate from a child's personality, will not lead to effective instruction. This means that block teachers must consider the entire child, the cognitive and affective domains, and how to best use time when delivering instruction. All this must be kept in consideration if the faculty is going to build an effective culture for block scheduling. While blocking can positively affect the teacher, and that is important, we must keep our focus on the student.

Please visit www.blockscheduling.com to review and download additional materials about developmentally-appropriate procedures to use with varied age groups in extended periods of time.

FOUR



Building the Block Culture in the School

Increasingly, as more schools have moved to the block, a distinct culture has developed. For schools to be successful on the block today, the faculty must accept a change in the culture of the school. This cultural transformation is more than a simple change in when the bells ring. The block culture allows for a school environment in which teachers and students have greater freedom in the instructional process. This means that in addition to faculty members, students and parents have to be willing to accept change. But although student and parent input and concerns should receive great attention, those of us involved with the block for 10 years or more know that the ultimate key to a successful conversion is the classroom teacher; teachers make or break this transformation.

For schools on a traditional schedule that are planning to look at block models, principals can start by conducting a survey during a faculty meeting. Along with the survey, a simple discussion of present school needs can elicit the level of interest needed to change perceptions about the block. Many teachers have misconceptions about the block, so it is imperative to begin research on scheduling methods and have solid answers for any inquiries. The top five perceptions that traditional teachers state as advantages and disadvantages about the block include are these:

Advantages

1. Time to complete activities in one period
2. Fewer subjects for students at any one time
3. Increased planning time for faculty on a daily basis
4. Greater opportunity to practice effective teaching strategies
5. Time for review, teaching, and practice

Disadvantages

1. Limited staff development during the initial stages of implementation
2. Motivating students and keeping their attention for an extended period of time
3. Teachers being unwilling or unable to change instructional strategies
4. Possible larger gaps of time between sequential courses
5. Fear of not enough time to cover the complete course content

Once the decision is made to move to the block, it is imperative that the block culture in the school maintain faculty confidence. School leaders must ensure faculty members that the change process will be deliberate and will progress cautiously. The school should not move hastily into a block schedule without proper training of faculty and staff. Collecting research, visiting schools, and completing appropriate training take one to two years. During these planning years, various opportunities for training should include mastering a minimum of six major instructional strategies. Some strategies include synectics, cooperative learning, case method, inquiry, and concept attainment. (See Part III of this text for more in-depth coverage of instructional strategies.) In addition, the planning years should be spent realigning curriculum for instructional pacing.

Communication is essential. Positive communication among teachers helps to build confidence in block scheduling. Experienced teachers can help newer teachers work in teams in harmony. In addition, committees can be a vital tool in maintaining effective communication and monitoring success. They can also serve to keep the administration aware of developing activities and concerns. Maintaining effective communication should include frequent classroom visits and encouragement by the principal. Each faculty meeting should include a period of time allocated for talk on block scheduling success stories and problem issues.

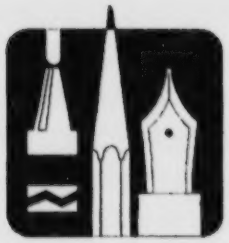
When monitoring the implemented block schedule, lead teachers and school administrators should search for improved instructional techniques and successful classroom experiences. They should also monitor the degree to which test scores are affected and the extent to which students are adjusting. It is important to keep students involved and to know

their feelings about the block and their classes. A survey of the students as well as the parents is a good way to learn about their feelings concerning the block schedule.

In the unfortunate event that the administration requires a unilateral move to the block or fails to seek faculty support, teachers may feel undervalued, angry, and adversarial. Resenting the change, teachers will not benefit from the philosophy of block scheduling as a reform tool. Reassuring teachers that the cultural change to the block will be completed in an appropriately paced and orderly fashion can help eliminate their insecurity. Many teachers retain a degree of wariness of the unknown. This is usually mild and will subside with periods of success. In more severe cases, teachers who have major reservations, but who have agreed to make the change, must be given special attention and greater reassurance.

Visit my website for interactive discussion on how to build or improve culture in your school. See how others have done it.

FIVE



Selecting the Best Fit

Currently, there are several organizational methods of block scheduling. These methods are divided into three types: the 4x4 block schedule, the A/B block schedule, and modified block schedule.

THE 4 X 4 BLOCK SCHEDULE MODEL

Classes in the 4x4 model of block scheduling are taught in longer periods of approximately 90 minutes and meet for only a part of the school year, usually one semester (see Table 5.1). The 4x4 model is also known as the semester, or accelerated schedule, because only four courses are taught per semester. Students have the opportunity to take eight different classes in one academic year. Teachers teach three classes per semester and use the fourth period of their day for planning, which is an advantage for teachers. "Educators have always been concerned about having enough time to complete the course content. Because of that, they found themselves looking for ways to change the traditional six- or seven-period day" (Queen, Algozzine, & Eaddy, 1997, p. 251).

Unlike the A/B schedule, the 4x4 model further limits the focus of students to four classes per semester so that there are fewer homework assignments, quizzes, and tests. This allows for concentration on new topics and time for mastery. Students also have the opportunity to repeat

Table 5.1. The 4×4 Block Schedule

Class Period (90-minutes)	*First Semester*	*Second Semester*
1st period	Biology	Algebra 1
2nd period	Chorus	Health/Physical Education
LUNCH	LUNCH	LUNCH
3rd period	ELP	English 1
4th period	Freshman Seminar	French II

failed classes within the same year and still graduate on time, which is an incentive to remain in school. Where applicable, many students opt for advanced study on and off campus since greater freedom is possible within the 4x4 block. For teachers, the 4x4 block reduces the preparation to three classes having a total of between 50 to 90 students, depending on the size of the school. Planning must involve more than preparing the usual lecture. Various instructional strategies that meet individual learning styles, alternative assessments, and integration of content should be planned for students. Lunch periods in smaller schools have sometimes been reduced to a single 45-minute period that serves for club meetings, teachers' office hours, detention, transfer student remediation, and general remediation.

The 4x4-scheduling model does, however, raise questions about the ability of students to retain information over the long periods of time that may occur between courses. It is possible for a student to finish Algebra I in the fall of his or her 9th-grade year and then take the next math class in the spring of the 10th-grade year. Although it is advisable to take sequential building courses as closely together as possible, teachers on the 4x4 block have not noticed any great difference between students who had recently finished a prerequisite course and students who finished the same course some time earlier.

■ THE A/B BLOCK SCHEDULE MODEL

Alternative day schedules or A/B block schedules alternate periods within the day or week. The classes usually meet every other day for extended blocks of time or a combination of alternating blocks and shortened classes taught every day for the entire year. Other modifications may be made to the A/B model by doubling a blocked class so that "A" days are Monday and Tuesday, followed by "B" days on Wednesday and Thursday. Fridays are rotated each week between "A" and "B" courses (see Table 5.2). Problems may arise with the A/B schedule; because the course load for students is not focused on four courses at a time, the students are enrolled in eight courses for an entire year. Many students have also expressed confusion as to keeping up with whether a day is "A" or "B."

Table 5.2. The A/B Block Design

"A" Day MONDAY	*"B" Day* TUESDAY	*"A" Day* WEDNESDAY	*"B" Day* THURSDAY	*"A" Day* FRIDAY	*"B" Day* MONDAY
Course 1 Language Arts	Course 5 Spanish 1	Course 1 Language Arts	Course 5 Spanish 1	Course 1 Language Arts	Course 5 Spanish 1
Course 2 Introduction to Computers	Course 6 Math	Course 2 Introduction to Computers	Course 6 Math	Course 2 Introduction to Computers	Course 6 Math
Lunch	Lunch	Lunch	Lunch	Lunch	Lunch
Course 3 Science	Course 7 Social Studies	Course 3 Science	Course 7 Social Studies	Course 3 Science	Course 7 Social Studies
Course 4 Health/P.E.	Course 8 Band	Course 4 Health/P.E.	Course 8 Band	Course 4 Health/P.E.	Course 8 Band

THE MODIFIED BLOCK

In the modified block, classes arranged in differing lengths of time during a quarter, semester, or year might be found in many schools throughout the country. The modified block offers students the opportunity of taking a variety of classes ranging in periods of 30 to 180 minutes in length. For example, if classes are typically 90 minutes in length on a particular block schedule, one period of the day may be modified by dividing it into two 45-minute sections, allowing students to take an additional course (see Table 5.3). Carroll (1990) asserted that every high school in the nation could increase course offerings and reduce the total number of students with whom a teacher works each day by more than half. Seminars dealing with complex issues can be offered with greater flexibility for a more productive instructional environment. This flexibility is the strength of the modified block schedule. From my experience of working with schools throughout the United States, I find that there really are few pure 4x4 or A/B models used. Most schools have modified a grade level, subject area, or both to accommodate their students and provide the best fit for their schools.

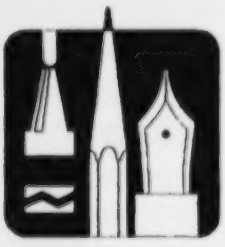
In 1994, Carroll reported his findings from a study of eight high schools that used a type of modern, block plan known as the Copernican Plan. His findings included improved student attendance, a decrease in suspensions, reductions in dropout rates, greater content mastery seen in higher grades and credits earned, and a favorable rating for the Copernican Plan compared with the traditional schedule. With these approaches becoming more widely used, educators began pushing for and rushing to the block. After high school teachers learned the value and benefits of the block, middle school educators raised the banner for block scheduling in their schools.

Register your opinions about the best type of block scheduling. Go to my website, under "Block Scheduling Handbook" and select the button for THE BEST FIT. Share stories about your successes with a particular model. Talk with other teachers around the United States and other countries about block scheduling models.

Table 5.3. The Modified Block Schedule

Class Period (90 minutes)	*First Semester*	*Second Semester*
1st period	Biology	Algebra 1
2nd period	Chorus	U. S. History
LUNCH	LUNCH	LUNCH
3rd period	English 1	English 2
4th period	Band (45 minutes)	Band (45 minutes)
	P.E. (45 minutes)	Art (45 minutes)

SIX



Block Scheduling in the Middle School

THE MIDDLE SCHOOL DEFINED

There is really no established or set definition for the middle school. Typically, school systems place Grades 6, 7, and 8 in the middle schools. Nevertheless, the main purpose behind the middle school movement is to recognize that early adolescence is a distinct stage in development. The task for middle schools is to protect, nurture, counsel, and teach the individuals at this unique stage of life (Farmer, Gould, Herring, Linn, & Theobold, 1995). Many educators believe there are five to seven program characteristics that make the middle school unique. The more characteristics or concepts that are present, the greater the chance that the purpose of the middle school can be achieved.

The characteristics of the middle school are usually described in programmatic terms such as:

Team teaching/interdisciplinary teaching

Block classes or periods

Advisor program/advisor/teacher or student mentor

Exploratory studies/ electives

Interactive instructional strategies

Basic subjects or core curriculum

Effective transitions

While all of these characteristics are important in their various forms, I am focusing on the first three in this chapter. Instructional strategies will be discussed in detail in later chapters. (Queen, 2002; Rettig & Canady, 2000; DiBiase & Queen, 1999; Russell, 1997; Farmer et al., 1995; George & Alexander, 1993).

■ CHARACTERISTICS OF THE MIDDLE SCHOOL

Team Teaching/Interdisciplinary Teaming

The grouping of students and teachers is an important characteristic of the middle school concept. One of the most important grouping concepts is interdisciplinary teaming. Students are organized into heterogeneous teams of 70 to 150 students (Farmer et al., 1995). It is important to note that they are not grouped by ability, race, sex, or any other specific characteristic. The teams can be established by grade level or they can be multiage. Multiage grouping allows students to stay on the same team with the same teachers throughout their middle school years (McClure, 1998). The teaming approach allows teachers to meet the individual student's needs by providing a variety of groupings within their teams.

Two to five teachers are usually organized in areas of math, science, social studies, and language arts. In this professional collaboration, teachers are involved in an interactive process that brings staff members together to make decisions (Gable & Manning, 1997). The teaming approach allows for better communication and understanding among the disciplines. There are also nonacademic benefits to interdisciplinary teaming. For example, teachers can better deal with discipline issues when they work together on a regular basis. Students tend to be more comfortable discussing problems or asking for advice because they interact with fewer teachers. Consequently, teachers are better able to serve the needs of those students.

Block Classes or Periods

One of the most important concepts in middle school is the schedule. The schedule serves many functions. According to Rettig and Canady (2000), the schedule

> provides a more reasonable workload for teachers and students . . . determines the number of student/grades/records for which a teacher must be responsible. . . can reduce how frequently students and teacher teams change classes . . . determines how many teachers a student must interact with on any given day/term/year

> . . .[and] can fundamentally affect the relationship among staff and between staff and students. (pp. 6-7)

Although the schedule is a critical component for middle school, it must not be allowed to dominate and must still be flexible enough to meet the students' needs.

Interdisciplinary teams cannot use the traditional schedule if they truly want to meet the needs of the adolescent student. With a block scheduling approach, the academic courses are scheduled within a large block of time, and other subjects, such as art, music, drama, physical education, and foreign language, are scheduled during shorter time periods. These other subjects are designed to be, and should remain, exploratory in nature. The focus of the schedule should be on the core academics.

Block scheduling in the middle school setting offers many advantages. For example, teachers have a common planning time for team collaboration and conferencing. The interdisciplinary teams have the flexibility to schedule classes to meet student needs. Other advantages to consider are that teachers can team teach in any given subject area, can more easily integrate the disciplines, and can more easily schedule field trips, speakers, and community projects (Farmer et al., 1995).

There are many block scheduling models for the middle school. Some use variations of the 4x4 or A/B designs used by the high schools. Rettig and Canady (2000) recommend a simple procedure that allows each interdisciplinary team to create its own schedule for the school year. First, the specific number of time modules needs to be determined. The schedule of events that occur outside "team time" must be plugged in. These events include lunch and exploratory time slots for specific teams (Rettig & Canady, 2000). It has also been recommended that once the core subjects are plugged in, the academic courses rotate. This prevents a course from meeting exclusively in the early morning or late afternoon (Rettig & Canady, 2000).

Advisory Programs

One of the most important characteristics of the middle school concept is the adviser/advisee program. The program developed from a commitment to meet the needs of the adolescent student. One teacher works with a small group of students—typically, between 20 and 30. All teachers, including art, physical education, and life skills teachers have a group of students as advisees. Every student needs to have a positive relationship with at least one adult in the school. This is such an important concept that time is provided for advisement daily. Students are provided with an "adult advocate" who knows each one personally and can help in making responsible choices.

Student academic progress is monitored on a regular basis, and parents are contacted to provide information about the student's progress. When teachers take this responsibility seriously, students have someone in the

school with whom they can talk and who can arrange help for them, both of which help to prevent student problems (Farmer et al., 1995).

Benefits of the Block Schedule in the Middle School

DiBiase and Queen (1999) believe that the middle school is prime for gaining the benefits of the block. In the middle school model, block-scheduled classes involve blocking math/science and language arts/social studies with the expectation that instructional time within the blocks be adjusted as needed. However, any additional time provided to one of the paired subjects is at the expense of the other.

Many reform documents recommend lengthening the amount of time that middle grades students spend in a learning environment. In its report *Turning Points: Preparing American Youth for the 21st Century*, the Carnegie Council on Adolescent Development (1989) cautioned against limiting classes to 40 or 50 minutes and emphasized the need for concentrated time blocks of learning: "Students need time to learn and teachers should be able to create blocks of time for instruction that best meets the needs of students, responds to curriculum priorities, and capitalizes on learning opportunities such as current events" (p. 52). Furthermore, the report asserts that for most adolescents, the shift from elementary to junior high or middle school means moving from a small neighborhood school and the stability of one primary classroom to a much larger, more impersonal institution. In this new setting, teachers and classmates will change as many as six or seven times a day. This constant shifting creates formidable barriers to the formation of stable peer groups and close, supporting relationships with caring adults. The chances that young people will feel lost are enormous (Hackmann, 1995).

Time management is usually perceived as the most important tool that administrators use in scheduling the school day. Time management, however, is not the only concern that educators have in developing a successful schedule. A continual search for the best way to meet the needs of all students remains a primary focus. Block scheduling makes time more than just a tool. As such, block scheduling provides choices and various alternative means to address key factors in middle schools today. In addition, block or flexible schedules can be configured to meet any middle school's physical plant, student management, accountability, assessment, instructional, and fiscal needs. As such, block scheduling plays an integral role in helping define the school's climate.

■ SHORTFALLS OF THE TRADITIONAL SCHEDULE

Traditionally-scheduled middle schools are generally organized around six to eight daily periods of instruction. The length of these periods ranges anywhere from 40 to 55 minutes, with three to five minutes for changing classes. In these short instructional periods, course content rather than the

students' learning needs becomes the teachers' focus. Middle grade students find themselves overwhelmed by six to eight different teachers, a disjointed curriculum, several sets of class rules, multiple homework assignments, and stacks of books. The typical day for a middle school student with this type of schedule consists of several different classes, an advisory period, and lunch—all in different locations—in a six-and-a-half-hour day. Students are expected to accumulate fragments of information and are tested on how well they can memorize details and facts. This is not a schedule that fosters reflection (Carroll, 1990).

Not only do the students languish in the 40- to 55-minute period, teachers are limited in the types of instructional strategies they are able to use. Just as in the high school, lecture is the most efficient way to expose students to a large amount of information in a short time frame. Highly effective teaching strategies such as cooperative learning, exploration, concept attainment, inquiry, role-playing, and simulations are difficult to implement in a span of 20 to 35 minutes (Canady & Rettig, 1995a). In addition, a six- to eight-period day promotes isolation of teachers and works against teaming, a practice that is integral for effective middle school instruction. Also, short periods favor the compartmentalization of knowledge rather than an integration of the curriculum. Teachers are unable to get to know their students as individuals because a great deal of their daily energy is spent monitoring student movement through the halls up to eight or nine times a day, recording attendance in as many as eight classes, and recording grades for as many as 150 or more students (Miller, 1997). As the student population increases in diversity, teachers must struggle to meet the emotional and academic needs of heterogeneous classes in which they may not have time for either effective instruction or authentic assessment.

THE FLEXIBLE/ALTERNATE/NAVIGATE (FAN) MODELS

Queen's flexible/alernative/navigate (FAN) block models, particularly the 3x2 FAN, are the most effective block schedules to implement at the middle school level. The 4x4 and the A/B block are better suited to meet the teaching and learning needs at the high school level. The 3x2 and related modified models of block schedules meet the needs of middle grades learners. In the FAN models, classes meet either every day or every other day. The master schedule includes an advisory and a combination of core and elective classes. Classes meet for either extended or shortened blocks of time. Classes are taught on a yearly or semester basis. Teachers teach four or five periods per day and use the remaining period(s) for both individual and/or team planning. Students carry anywhere from five to six classes. Table 6.1 depicts the basic framework of the 3x2 model. By way of example, the scheduling of science and social studies is highlighted.

In the basic 3x2 schedule, three classes meet in 90-minute blocks (Blocks A, B, & C) and two classes meet for 45-minutes a day (Block D).

Table 6.1. The 3×2 Model

A. The Basic Schedule

	Monday	*Tuesday*	*Wednesday*	*Thursday*	*Friday*
90 min.	**Block A** Language Arts	**Block A**	**Block A**	**Block A**	**Block A**
90 min.	**Block B** Mathematics	**Block B**	**Block B**	**Block B**	**Block B**
90 min.	**Block C** Science/ Social Studies	**Block C**	**Block C**	**Block C**	**Block C**
(90 min.) 45 min. 45 min.	**Block D** Elective Elective	**Block D**	**Block D**	**Block D**	**Block D**
	Advisory	Advisory	Advisory	Advisory	Advisory

B. Science/Social Studies: Alternate Days

Block D Week 1	Social Studies	Science	Social Studies	Science	Social Studies
Block D Week 2	Social Studies	Science	Science	Social Studies	Social Studies

C. Science/Social Studies: Semester

Block D Semester 1	Social Studies	Social Studies	Social Studies	Social Studies	Social Studies
Block D Semester 2	Science	Science	Science	Science	Science

Classes can meet every day or alternate on an A/B schedule. In the A/B configuration, Monday and Wednesday are "A" days and Tuesday and Thursday are designated "B" days. Fridays can rotate each week between "A" and "B" courses or contain a shortened schedule during which all classes meet. Blocks A through C meet for the whole year, whereas the classes in Block D can meet on either a yearlong or semester basis. Science and social studies are offered during Block D. In addition, Fridays can be used to implement special exploratory and research courses, electives, seminars, clubs, or assemblies.

Queen (1999) has developed eight major FAN block scheduling models. Tables 6.2 and 6.3 demonstrate two such examples.

The FAN block model provides the middle school with an almost limitless number of scheduling options. Classes can be offered in combinations of 90-, 45-, and 30-minute blocks of time. This allows for core and elective classes to be configured in the format that best serves the needs of the students. Table 6.2 shows how the FAN model can be embedded into

Table 6.2. The Eight-Period Queen Model

A. The Basic Schedule

Period	*Time Allotment*	*Description*
1 & 2	90 minutes	Language Arts: Block A—This class meets daily or on alternating days for a 90-minute block of time.
3 & 4	90 minutes	Mathematics: Block B—This class meets daily or on alternating days for a 90-minute block of time.
5	45 minutes	Mini-Block C Science/Social Studies
6	45 minutes	Mini-Block D Science/Social Studies
7	45 minutes	Mini-Block E Elective
8	45 minutes	Mini-Block F Elective
		Advisory

B. Science/Social Studies: Alternate Days

Mini-Blocks C&D	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*
Per. 5 Week 1	Social Studies	Science	Social Studies	Science	Social Studies
Per. 6 Week 2	Science	Social Studies	Science	Social Studies	Science

C. Science/Social Studies: Semester

Per. 5 Semester 1	Social Studies	Social Studies	Social Studies	Social Studies	Social Studies
Per. 6 Semester 2	Science	Science	Science	Science	Science

an eight-period day. In this model, the school day is divided into two 90-minute and four 45-minutes blocks of time.

- Classes in Blocks A and B meet daily for 90 minutes.
- Classes in Mini-Blocks C through F meet either daily or on alternating days for combinations of 45- and/or 90-minute blocks of time.
- Mini-blocked classes are either yearlong or semester length in duration. In this model, science and social studies are scheduled during Periods 5 and 6.

Table 6.3 depicts a FAN block schedule configured around a seven-period day:

- The class in Block A meets daily or on alternating days for a 90-minute block of time.
- The classes in Mini-Blocks B through D meet daily and/or on alternating days for combinations of 30- and/or 60-minute blocks of time.
- The classes in Mini-Blocks E and F meet daily and/or on alternating days for either two 45-minute or one 90-minute block of time.

The model in Table 6.3 provides a great amount of flexibility when scheduling classes. This model allows for the scheduling of core and elective courses, an advisory, one or more exploratory classes, and club meetings, as well as seminar classes. In this model, science and social studies can be offered either during Periods 3 and 4 or during Period 6.

ADVANTAGES OF MODIFIED SCHEDULES IN THE MIDDLE SCHOOL

There are many advantages to moving to a modified block schedule, a number of which are presented below. The list was gleaned from comments made by middle school teachers who are teaching in schools that have adopted block scheduling (Queen, 1999). The 3x2 block schedule achieves the following:

- Relieves the fast-paced, pressurized atmosphere found in many middle schools
- Offers teachers and students innovative ways to interact with one another and accomplish their objectives
- Provides opportunities for creativity in classroom instruction designed to promote in-depth learning (inquiry, research, cooperative learning groups, thematic units, computers and other learning technologies, and hands-on learning experiences)
- Supports teaming by providing time for individual and/or team planning
- Facilitates integration of the curriculum
- Cuts the number of class changes and movements that large groups of students make in one day
- Reduces the number of administrative tasks performed in one day by teachers and students
- Improves the student-teacher ratio so that teachers can know more about each student's individual learning and social needs
- Helps teachers make effective use of planning time by reducing the number of courses taught in one day
- Matches learning time to the learner and to the course content
- Results in fewer discipline problems

- Provides time for one-to-one interaction between students and teacher
- Provides time for teachers to get to know their students and develop better rapport
- Establishes a classroom environment that is more amenable to students

Table 6.3. The Seven-Period Queen Modified Model

A. The Basic Schedule

Period	*Time Allotment*	*Description*
1	45 minutes	Block A—Language Arts
2	45 minutes	
3	30 minutes	Mini-Block B
4	30 minutes	Mini-Block C
5	30 minutes	Mini-Block D
6	45 minutes	Mini-Block E
7	45 minutes	Mini-Block F

Block A: Meets daily or alternating days for a 90-minute block of time (Language Arts)

Mini-Blocks B-D: Meet daily and/or on alternating days for combinations of 30- and/or 60-minute blocks of time (electives, math, science, social studies)

Mini-Blocks E &F: Meet daily and/or on alternating days for combinations of 45- and/or 90-minute blocks of time (electives, math, science, social studies)

B. Science/Social Studies: Alternate Days

	Monday	*Tuesday*	*Wednesday*	*Thursday*	*Friday*
Per. 3&4 or Per. 6 Week 1	Social Studies	Science	Social Studies	Science	Social Studies
Per. 3&4 or Per. 6 Week 2	Science	Social Studies	Science	Social Studies	Science

C. Science/Social Studies: Semester

	Monday	*Tuesday*	*Wednesday*	*Thursday*	*Friday*
Per. 3&4 or Per. 6 Semester 1	Social Studies	Social Studies	Social Studies	Social Studies	Social Studies
Per. 3&4 or Per. 6 Semester 2	Science	Science	Science	Science	Science

The major advantage of the FAN model is that it allows for the schedule to be configured so that it meets the individual and collective needs of middle grades learners. FAN block scheduling gives individual students the opportunity to experience a wide variety of innovations, and this can bring about a positive change in the school's climate.

The positive change in school climate is a result of the reduction in class size, the ability of students to engage in open-ended learning experiences, and the ability to flex schedules to meet the needs of an increasingly diverse middle grades student population. The change in the school and classroom is also positive when teachers move away from the "introduction-lecture-review" format and vary the presentation of content. If the class structure changes every 20 to 30 minutes, interest can be maintained. An experiential-based curriculum encompassing reflection, cooperative learning, critical thinking, process writing, and active learning experiences will keep the pace brisk and the students engaged. Teachers and students are often surprised by the positive change in the classroom climate; the atmosphere is charged with energy and bustling with activity.

Evidence of improved school climate can best be seen in the decrease of reported discipline problems and in the cleanliness reports of the custodial staff. Students move around the school fewer times throughout the day, and that produces a safe and less frenzied atmosphere, which can be significant for student motivation and management. The pace of the school day is slowed, while active learning and interaction among teachers and students is increased (Queen & Gaskey, 1997).

By varying instruction, teachers are able to reach students from diverse backgrounds and learning styles. Methods such as cooperative learning increase positive social attitudes, increase self-confidence and self-efficacy, and foster open-mindedness and appreciation of others. Class projects require interdependence, individual responsibilities, and specified goals. Along with varied teaching methodologies, block scheduling provides students with the time to demonstrate what they know.

■ TEACHING IN THE BLOCK IN THE MIDDLE SCHOOL

Planning in block scheduling involves more than preparing a traditional classroom lecture. Instead, teachers need creative ways to actively engage students in learning. Various strategies that meet individual learning styles, authentic assessments, and integration of content can now be planned and implemented. Lunch periods can be reduced to 45 or 30 minutes, with the remaining time used for advisory time, club meetings, detention, and remediation.

One of the biggest concerns among teachers of block-scheduled classes is effective organization of instructional time. It is almost impossible to keep students' attention for a full 90 minutes. Passive sitting is especially inappropriate for the physical needs of middle school students (Hackmann, 1995). As such, teaching strategies in blocked classes must

include more than the traditional chalk and talk. Cooperative learning, group problem solving, learning centers, and discovery learning are methods consistent with what is known about the social and emotional nature of middle grades learners. Following is a list of strategies designed to improve the quality of instruction in blocked classes:

- Make certain that all learning experiences are developmentally appropriate for middle grades students.
- Include topics of interest for the students. Make the content real and relevant.
- Have the students work alone and in collaborative groups.
- Incorporate the use of computers and other learning technologies.
- Use pacing guides for long-term planning.
- Structure learning experiences in a learning cycle format of preassessment, exploration, concept development, and concept application. This method of instruction incorporates the use of discovery and open-ended inquiry. This will allow the students to discover personal meanings and understandings and construct their own knowledge.
- Do not let the adopted text drive the curriculum.
- Use a variety of resource materials, including, but not limited to, texts, trade books, magazines (such as *Cable in the Classroom*), newspapers, and the Internet.
- Use assessment alternatives, including journals, portfolios, traditional pencil-and-paper tests, and performance-based tasks. This will provide students with more than one way to demonstrate what they know, what they can do, and what they have learned.
- Use higher-level questions.
- Engage the students in a variety of student-directed activities.
- Let students do the work. Teachers become assistants to the learning process. "Do not do anything that students can do!"(Bohince, 1996, p. 21).
- Make students take responsibility for a variety of tasks.

SUMMARY

With more schools adopting block scheduling to restructure the school day so that time is used more effectively, I proposed the following question for research: What is the effectiveness of block scheduling when compared with traditional scheduling? After reviewing the work of several researchers, I found the following advantages most often: increased instructional time, smaller classes, fewer classes to prepare for, more in-depth study of concepts, a decrease in the number of discipline problems, increased student-teacher interaction, students and teachers getting to

know each other better, students earning more credits per year, increased planning time for teachers, better grades earned by students, and an opportunity for students to take more electives. The disadvantages found most often included less curriculum being covered, a decrease in the number of contact minutes with students in each class, difficulty in placing transfer students, and problems with the succession of courses. When asked, most students and teachers believe the block schedule to be successful and would not want to return to the traditional schedule. With so many schools finding success with the block schedule, its adoption is becoming increasingly popular. It has proven to be an effective means of restructuring the school day to use time more effectively. With more changes being made every day to increase its effectiveness, more schools will adopt the schedule, possibly making the traditional schedule obsolete. But before all this can happen, there is a need for further research on the long-term effects of block scheduling.

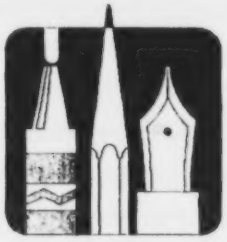
Middle schools exist to meet the educational and social needs of young adolescents. As such, middle school programming concepts need to be aligned with the social, biological, and cognitive development and achievement needs of middle grades learners. The programming concepts that middle schools have adopted to meet these needs include interdisciplinary teaming/blocked classes, advisory, exploratory, developmentally appropriate teaching strategies, and a core curriculum. There is a growing ethnic, racial, linguistic, and socioeconomic diversity within the middle school population. As such, there is a growing consensus that collaboration, student grouping, and scheduling options are essential if the needs of all middle grades learners are to be met.

Before the implementation of blocked classes, middle school schedules were generally organized around six to eight daily periods. In these short instructional periods, the teacher's focus is on course content and not on the student's learning needs. In addition, teachers are limited to the types of instructional strategies they are able to use. Block scheduling provides choices and alternative means to address these issues as well as other key factors in middle schools today.

The modified models are the most effective block schedules to implement at the middle school level. These models meet the needs of all middle grades learners by supporting each of the five middle school programming concepts. In addition, FAN block models provide middle schools with an almost limitless number of scheduling options. This allows for core and elective classes to be configured so that the individual and collective needs of middle grades learners are met. Adoption of either a 3x2 or some variant model will bring about a positive change in a middle school's climate.

Visit the special middle school link on my website and check out additional suggestions and ideas for teaching block at the middle school level.

SEVEN



The Elementary School on the Block

The elementary school is an important breeding ground for the educational pursuits of children. It is the place where the schooling process begins, so the elementary school must be inviting and exciting to all students who attend. Its history dates back over two centuries in the United States and even further on the continent of Europe. The young child, between the entrance into kindergarten and the exit of fifth grade, experiences myriad developmental changes. The effective principal is aware of these changes in the student body as a whole and accounts for them in the vision and mission of the school. Also, the curriculum taught at this level is crucial because it is probably the initial student encounter with an organized body of study. An understanding of its distinct parts and programs is needed by the principals and teachers to implement the mandated curriculum effectively and efficiently. Various strategies exist to organize the elementary school, and each school, through its uniqueness, has that one best way to be arranged for instruction. The principal must identify this particular arrangement and implement it with all deliberate speed.

HISTORICAL EVENTS IMPACTING THE ELEMENTARY SCHOOL

Johann Heinrich Pestalozzi (1746-1827) was a working-class Swiss who believed that the best educational process was to move away from traditional methods. One of his central tenets was that children learned best through their senses and when they are motivated through their own interests. "His conviction that children's learning is essentially self-motivated gave rise to a teaching methodology that de-emphasized schoolbooks and most of the traditional school subjects, attempting to stimulate and reinforce the child's naturally inquisitive behavior" (Woods, 1998, p. 307). Pestalozzi contended that a child's education began at birth and contained graduated steps that built on prior knowledge (Green, 1969). His thoughts and ideas centered on the principle of *Anschauung*, which can be translated as observation, intuition, contemplation, sense experience, perception, and sense impression (Downs, 1975). Teaching needed to be inductive, which Pestalozzi believed was the introduction of unknown material to the students based on what they knew. Pestalozzi began a school at Stans in 1799 where there were no lesson plans and no books and he taught whatever he saw the moment dictate. A distinct portion of his instruction was called "object teaching," which basically consisted of nature walks during which the students could learn by exploration (Woods, 1998).

Pestalozzi's educational ideas first began to surface in the United States during the early part of the 19th century. William Maclure, a businessman from Philadelphia, traveled to Europe and observed the teaching style and strategies of Pestalozzi. Maclure tried to persuade Pestalozzi to immigrate to the United States and establish a school that he would fund. He could not convince Pestalozzi to come, but Joseph Neef, Pestalozzi's former assistant, did come and establish the first Pestalozzian School in the United States in 1806. Neef used no textbooks in his new school and provided only oral instruction from the blackboards (Downs, 1975). The school eventually failed, and evidence of Pestalozzi disappeared for the next half century.

Beginning in 1860, the educational ideas of Pestalozzi began to reappear in different parts of the country. Horace Mann, considered the leader of the common school movement, traveled to Europe to visit Pestalozzian schools and returned to America highly recommending these teaching methods. The first evidence of an entire school system adopting the Pestalozzian method was in Oswego, New York. In 1861, Superintendent Edward A. Sheldon implemented these instructional practices in his system and even had his teachers formally trained in the methods of Pestalozzi. Also, William T. Harris, Superintendent of the St. Louis Public Schools, used the ideas of Pestalozzi as the basis for the instructional practices in the elementary schools (Downs, 1975).

Friedrich Froebel (1782-1852) was a German educator credited with the first use of the kindergarten—a garden where children grow—for young

children (Zais, 1976). Froebel's approach to the education of young children was rooted deeply within his religious (Christian) beliefs. He contended that the education of the child should lead to a harmony with God and nature (Woodham-Smith, 1969). He believed that the child needed a special environment in which to grow and learn. "The educator needs to be highly conscious of his own intentions and actions and finely sensitive to the child's total needs" (Lilley, 1967, p. 23). Froebel stressed the importance of play in the overall development of the child and used it as the basis for his kindergarten curriculum. Along with the "play" aspect, Froebel contended that the children's schooling should be organized around individual and group interests and activities (Ornstein & Hunkins, 1998).

Froebel wrote extensively about his ideas concerning education, but he often considered that his greatest work was *The Education of Man*, published in 1826. In his writing, Froebel emphasized the importance of character development and the need for the child to prosper in accordance with nature. "He wanted the kindergarten to be centered around the whole child and contended that every human being, even as a child, must be recognized, acknowledged, and fostered as a necessary and essential member of humanity" (Woodham-Smith, 1969, p. 21).

NATIONAL INITIATIVES

The elementary curriculum has changed greatly over the years. Beginning as a basic study of how to read the Bible and civic documents, it has now evolved to such an extent that it contains many goals and objectives directly related to technology. Computer and information-processing skills are commonplace around the nation in various state curriculums. There have been pushes for national curricula where students in all states would study and learn identical material and information. America 2000 and Goals 2000 are examples of acts and legislation attempting to set high goals for the United States and, in doing so, would standardize the curricula of all states.

America 2000

President George H. W. Bush and the National Governors Association met in 1990 and established six national education goals for United States to accomplish by the year 2000. The President was calling on all Americans to be accountable for the youth of America. "The America 2000 strategy depends on the strong, long-term commitment of all Americans" (*America 2000*, 1991, p. 7). *America 2000: An Education Strategy* was the Bush Administration's four-part plan to meet those goals. A list of goals and a detailed account of the initiative follows:

1. Every child will start school ready to learn.
2. Raise the high school graduation rate to 90%.

3. Students will leave Grades 4, 8, and 12 showing competence in core subjects (English, math, science, geography).
4. Make our students first in the world in math and science.
5. Ensure that all citizens are literate and have the skills needed to compete in a global economy and exercise rights of citizenship.
6. Free schools of drugs and violence.

PART 1: FOR TODAY'S STUDENTS, BETTER, MORE ACCOUNTABLE SCHOOLS

There will be an emphasis on comparing the nation's schools to hold them more accountable to the stakeholders. The mission of the schools will be to prepare the students for college or the workforce. National and state report cards shall be issued to increase accountability to the public. Parents will have choices as to where to send their children to school; this competition will hopefully improve all schools. Local boards will be given more authority and responsibility to manage the schools thereby reducing the entanglement of the federal government and education. Also, there will be differential teacher pay based on his/her progress toward meeting the six outlined goals of America 2000.

PART 2: FOR TOMORROW'S STUDENTS, A NEW GENERATION OF AMERICAN SCHOOLS

Resources for extensive research and development will be employed in an effort to provide the best schools for future students. Business partnerships will provide much of the capital to develop these schools. In this new generation of schools, there will be a creative use of time, space, staff, and technology to maximize the educational opportunities available to the students. The governor of each state shall be responsible for the oversight of school development to ensure that they are constructed in the best way possible.

PART 3: FOR THE REST OF US (YESTERDAY'S STUDENTS AND TODAY'S WORKFORCE), A NATION OF STUDENTS

In the beginning of the 21st century, 84% of the workforce is empolyed. Although impacted to a degree by the depression influenced by the 9/11 terrorist attack, 78% of mothers with children over age six are in the workforce (Bryson, 2001). Workers need to adopt an attitude of lifelong learning and instill in their children a value for learning and education. Industries should establish skill standards for all employees to meet. There needs to be an overall skill upgrading of the workforce in order to keep pace with the competitive global marketplace. As a nation, we should strive for a substantial increase in adult literacy.

PART 4: COMMUNITIES WHERE LEARNING CAN HAPPEN.

America needs a "renaissance" of her values—strength of family, parental responsibility, neighborly commitment, and caring of churches, civic organizations, business, labor, and the media. Every level of government can facilitate these activities to solidify the fusion of strong communities. Developers can play a vital role in this revival by the implementation of effective community planning. Communities provide the breeding ground for learning and can benefit greatly from an educated populace.

Goals 2000: Educate America Act

The Goals 2000: Educate America Act was passed in 1994 under the Clinton administration. It basically reiterated the six goals of America 2000 issued three years earlier and added the goals of better teacher preparation programs and more parental involvement in education (Table 7.1). The act called for a change in the way children are educated. It started with the preschool child because Goal 1 stressed a belief in the importance of early childhood education (Lunenburg & Irby, 2000). Like America 2000, Goals 2000 stressed accountability, performance, and assessment. The United States had always considered itself the world's elite nation, and this legislation was an attempt to make our educational system world-class.

"The passage of Goals 2000 represents an important victory for the 'cosmopolitan centralists' of educational policy who advocate a stronger role for the federal government in improving schools" (Cookson, 1995, p. 405). Goals 2000 is a prime example of the federal government attempting to influence educational practices in the states. In prior decades, because the Constitution remained silent concerning the federal role in

Table 7.1. America 2000 and Goals 2000

America 2000	*Goals 2000*
1. Every child will start school ready to learn.	1. Every child will start school ready to learn.
2. Raise the high school graduation rate to 90%.	2. Raise the high school graduation rate to 90%.
3. Students will leave Grades 4, 8, and 12 showing competence in core subjects.	3. Students will leave Grades 4, 8, and 12 showing competence in core subjects.
4. Our students will be first in the world in math and science.	4. Our students will be first in the world in math and science.
5. All citizens will be literate and able to compete in a global economy.	5. All citizens will be literate and able to compete in a global economy.
6. Schools will be free of drugs and violence.	6. Schools will be free of drugs and violence.
	7. Teachers will have access to programs to enhance skills.
	8. Increase parental involvement.

education, states had held the responsibility and accountability for the educational decisions affecting their schools. In addition, the United States, unlike numerous other countries, does not maintain a federal agency with control over the national curriculum. However, with Goals 2000, the federal government with its vast financial resources has tried to influence the policymakers in the states. For school districts that showed significant progress toward the implementation of Goals 2000 on average $700 per child in federal funds were available in 1995. Cookson (1995) terms this practice the new "educational federalism" with federal politicians attempting to influence state-level decision makers in their legislative priorities. The pressure has come from the federal level to standardize the curriculum nationwide, but the results and success are yet to be determined and decided.

A STATE EXAMPLE: THE ELEMENTARY CURRICULUM IN NORTH CAROLINA

The North Carolina Standard Course of Study (2001) outlines the curriculum for all elementary students. The North Carolina Department of Public Instruction uses this document as a basis for all classroom instruction in the state.

Technology

North Carolina has three competency goals for technology in Grades K-5 (Table 7.2). They are as follows:

- Competency Goal 1: The learner will understand important issues of a technology-based society and will exhibit ethical behavior in the use of computer and other technologies.
- Competency Goal 2: The learner will demonstrate knowledge and skills in the use of computer and other technologies.
- Competency Goal 3: The learner will use a variety of technologies to access, analyze, interpret, synthesize, apply, and communicate information.

Table 7.2. Technology Objectives for North Carolina Elementary Students

1st Grade	Objective 2.4 • Indentify key words and/or sentences using word processing.
2nd Grade	Objective 3.1 • Collect, sort, and organize information to display as a graph or chart.
3rd Grade	Objective 2.6 • Identify the parts of a spreadsheet.
4th Grade	Objective 1.3 • Identify violations of the Copyright Law.
5th Grade	Objective 3.6 • Participate in curriculum-based telecommunications projects as a class activity.

Grades K-2. The objectives for grades K-2 mainly address basic computer skills and knowledge. The student will learn the physical parts of a computer, know correct care and use of the equipment, and become familiar with the keyboard. Some examples of basic skill objectives are being able to manipulate the cursor, arrange a picture, keying words and sentences, and using various drawing tools.

Grades 3-5. In the intermediate grades, the objectives become more complex and interrelated. Students will begin to learn copyright laws and how to telecommunicate. They will learn how to retrieve and edit a word processing document. The spreadsheet is introduced, and students study the parts of a spreadsheet and how to perform calculations. E-mail is used as a means of communication, and the learner becomes aware of the damage caused by computer viruses and vandalism.

English Language Arts

Grades K-2. A primary goal of the K-2 curriculum is the development of oral and written language abilities. A focus is placed on reading, and students are taught skills in decoding different texts. Also, the skill of reading comprehension is a focus for instruction. At this level, the students are inexperienced in the realm of structured learning, so they are exposed to strategies for learning how to learn. The main goal is for students, upon leaving second grade, to be able to independently read a text they have not seen before while using appropriate decoding skills.

Grades 3-5. The intermediate grades provide the opportunity for students to learn how to communicate critically, creatively, and effectively. The teacher attempts to make the crucial connection between school setting, personal experience, and real-world application. Students at this level are progressing toward automatic word recognition and strategic comprehension of read material—comprehending for a purpose. As the students' reading experiences increase, they become consumers of various types of literature, so they are taught how to make judgments on fiction and opinions. Metacognition is introduced as the students learn to think about their own thought processes.

Mathematics

Grades K-2. Initially, the student will learn how to read, write, and count using whole numbers. Next, the skill of comparing and ordering whole numbers is emphasized along with a basic understanding of place value. The learner will use tools to represent the mathematical operations with a concentration on addition and subtraction. These tools are important because many students at this early age are not able to write all of the mathematical operations. They learn simple shapes such as circle, square, rectangle, triangle, sphere, cylinder, and cube and practice drawing them. The concepts of length, width, and height are explored in addition to

money. The primary student will also perform simple probability experiments.

Grades 3-5. During the intermediate grades, students learn the meaning of equivalent fractions and decimals along with the properties of special numbers like 0 and 1. Problem-solving skills are furthered as students practice estimating answers to problems and practice basic multiplication and division. Children begin to tell time on both analog and digital clocks and understand the concept of elapsed time. Geometric terms such as *perimeter, parallel, perpendicular, congruent,* and *similar* are introduced. Students learn to use calculators and to construct tables and graphs—bar, circle, and pictograph.

Science

Grades K-5. Five unifying threads encompass all science instruction for Grades K-5:

1. Nature of science: Students will view science as a human endeavor.
2. Science as inquiry: Students will develop abilities to do and understand scientific inquiry.
3. Science as process: Students will learn and practice the science process skills—observe, classify, use numbers, communicate, measure, infer, predict, interpret, experiment, use space-time relations, control variables, formulate hypotheses, formulate models, define operationally.
4. Science and technology: Students will understand technology and design and be able to distinguish between natural and man-made objects.
5. Science in personal and societal perspectives: Issues such as personal health, changes in populations, and changes in the environment are developed and explored. Science and technology are discussed in regard to their local influence.

Social Studies

*Grades K-3.*The social studies curriculum begins with a study of what is most familiar to students. The students learn about the family and the home and then proceed to a survey of the characteristics of neighborhoods and communities. The student, by studying his or her immediate surroundings, can now make generalizations about other children in other parts of the world. History is introduced with the concept of "here and now." The primary curriculum is an interactive program consisting of relationship skills and the duties of citizenship and civic participation.

Grades 4-5. The intermediate level is when students begin their study of regions. The concentration of this regional study is North Carolina, the United States, Canada, and Latin America. In the Western Hemisphere,

half the instruction focuses on the United States and the other half on Canada and Latin America. The students learn how societies are organized along economic, social, and political lines. These studies are intended to equip the students to answer the following questions about their state, nation, and hemisphere:

1. Who are the people of this society, and what are their values and beliefs?
2. What is the environment in which the people live?
3. How is the society organized?
4. How do the people of this society make a living?
5. How has this society changed over time?

Fine Arts: Dance

Grades K-5. The elementary dance curriculum contains four strands that are relevant across all grade levels:

1. Creating: expressing ideas and feelings through dance
2. Performing: formal or informal—using technical, expressive, and interpretative skills
3. Responding: observing, describing, analyzing, critiquing, and evaluating dance
4. Understanding: relating dance knowledge to history, culture, and heritage

Fine Arts: Music

Grades K-5. The elementary music curriculum uses the four strands present in the dance curriculum:

1. Creating: expressing feelings through composing or arranging music
2. Performing: presenting an existing work, formally or informally; calls upon technical, expressive, and interpretative skills
3. Responding: listening, analyzing, critiquing, describing, evaluating, and moving to music
4. Understanding: application of knowledge of music to history, culture, and heritage

Fine Arts: Theater

Grades K-5. The theater arts program has skills that guide the instruction at each grade level. These skills are perceiving, thinking, comprehending, applying, integrating, communicating, creating, analyzing, and critiquing. There are two focus areas for theater instruction at the elementary level:

1. K-2. Imitating: to use or follow as a model the actions or mannerisms or speech of others
2. 3-5: Presenting: to offer or share, usually in a classroom or informal setting, a portrayal or other theater work for consideration or display

Fine Arts: Visual Arts

Grades K-5. The visual arts curriculum has skills and processes that guide the teaching and learning sequence for the elementary school. They are as follows:

1. Perceiving: to be aware of surroundings
2. Producing: to use art to communicate
3. Knowing: to understand historical perspective of art
4. Communicating: to use multiple intelligences to use artistic expression to interchange ideas
5. Evaluating: to produce critical responses to artistic expression
6. Connecting: to understand relationships between art and other aspects of life

ORGANIZATIONAL PATTERNS

The elementary school of today is arranged by grade, which is basically an age grouping. The students start kindergarten at age five and exit the elementary school around the age of 11. The movement from grade to grade is according to age, and this process is called the vertical organization plan (Reinhartz & Beach, 1997). The curriculum of each grade contains a specific set of skills and topics to be covered and mastered before promotion to the next grade.

There is a long history behind the graded system of organization. During the 1830s Samuel Burnside, Henry Barnard, and Horace Mann urged schools to adopt this type of organization to increase the efficiency of operation (Noble & Dawon, 1961). The initial example of this practice occurred in the New Quincy Grammar School of Boston in 1848. John Philbrick, school principal, had a new building erected with 12 classrooms. Therefore, the instruction was graded, and students were distributed equally based on achievement among the 12 assistant teachers. This practice was more common in urban areas around the country for decades; it was 1900 before it appeared in many of the rural schools.

Disadvantages of Graded Arrangement

Although the graded arrangement has been used for many years, its disadvantages bring its true effectiveness into question. One problem is

that students are placed into grade levels regardless of their development and ability. Many times, the students and grade levels simply do not match. The curriculum is lockstep and not paced accordingly for the students (Reinhartz & Beach, 1997). Too often, textbooks dominate the curriculum, and teachers are more concerned with covering the grade-level material instead of differentiating their instruction to meet individual student needs.

Alternative Possibilities for Scheduling

Looping

Looping is generally defined as a teacher remaining with a group of students for more than one year. This practice is quite common in the elementary schools of the United States, and it greatly benefits the students and teachers. Because the teacher-pupil relationship has time to develop over a two-year time period, academic achievement tends to be greater (Forsten, Grant, & Richardson, 2000). Also, the teacher has an extended time frame in which to learn the strengths and weaknesses of the students and can differentiate instruction to better suit a group of learners (Crosby, 1993). The curriculum now can be dominated less by the notion of covering everything during the year, and the teacher can focus more on cooperative learning strategies and group project assignments (Burke, 1997). These processes give the learners more authentic activities that will greatly increase their retention of knowledge and information.

Multiage Classrooms

Another alternative to the traditional graded program is the multiage classroom in which the teacher has students of different ages in the classroom working each at their own pace. A benefit from this arrangement is that students move from easy to more difficult material when they are ready, and peer tutoring is readily available because of the differing ages of fellow classmates (Leslie & Halpert, 1996). "Advancement to the next unit depends on the mastery of subject matter, regardless of age or attendance, and students who have mastered content can help those in need of additional assistance" (Kolstad & McFadden, 1998, p. 14). Students learn to take responsibility for their own learning because they work individually and in groups on a daily basis, this is necessary for classmates who work at different levels. The high rate of language skill development is evident because of the continuous interaction with older students who have mastered more complex skills (Kolstad & McFadden, 1998).

4-BLOCKS MODEL FOR ELEMENTARY EDUCATION ■

The 4-blocks model is an instructional model based on the premise that there are four fundamental ways that all children learn to read. The model

ensures that students are exposed to all four methods every day, thereby addressing the individual learning styles of children. The four blocks are (1) guided reading, (2) writing, (3) working with words, and (4) self-selected reading. Most elementary teachers would agree that it is important to construct a balanced approach to literacy instruction that could address the individual needs of children to create a community of learner in a heterogeneous classroom setting.

The 4-blocks model is a literacy framework that can be used in isolation by an individual teacher in a school, even without the support of his or her peers and administrators, although the most successful teachers are those with a strong network of support from the staff and other faculty members.

Although it's important to use this model in a supportive environment, the 4-blocks model probably best serves a self-contained classroom. Keeping the blocks under one teacher's guidance is the best plan. One disadvantage of the model is that, often, teachers and or administrators change the design for various reasons. Sometimes the changes are minor; however, if the intent of the blocks is altered, the expected results may change as well (Sigmon, 2001).

■ PARALLEL BLOCK SCHEDULING

The elementary curriculum continues to evolve with more content being added and little subtracted. Teachers are required to teach more content in the same amount of time while incorporating such strategies and interdisciplinary instruction. Parallel block scheduling is a way of structuring time within a school day to facilitate instructions and to reduce the student-teacher ratio during designated time periods. Large and small blocks of time can be distributed among several teachers in a grade level by giving each teacher more minutes each day (i.e., 90 minutes) for whole-group instruction in language arts and social studies, with less time (i.e., 50 minutes) each for reading and writing in smaller groups.

During whole-group instruction, the teacher may use social studies content to teach a language unit on research skills. The students may reinforce those skills in small groups during reading or writing time and also in extension center. Students may also be assigned to the library during extension center time where a media specialist will instruct them on effective use of the card catalog or an online computer search. There are many options for instruction in the parallel blocking model.

According to Canady and Hopkins (1997) parallel block scheduling produces the following instructional benefits: (1) smaller class size during critical instructional periods; (2) less reliance on strict ability grouping; (3) less fragmentation of the school day due to better integration of support programs such as special education, gifted education, and Title I; (4) more efficient and effective use of instructional staff; (5) significantly higher student engagement rates in learning activities; and (6) increased test scores.

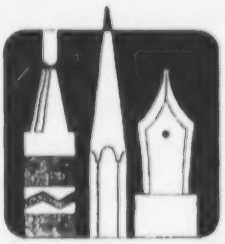
With parallel block scheduling, the benefits of flexibility can be achieved with few additional expenditures. The schedule is built basically around half-class instruction groups in reading and mathematics. Homerooms are usually comprised of approximately 25 students, with reading and math taught in groups of fewer than 15, thereby magnifying instructional time and increasing student achievement (Canady & Rettig, 2001).

SUMMARY ■

Restructuring of time occurs as educators capitalize on the potential of innovative scheduling as a means to improve schools. "With open minds and equal doses of creativity and technical expertise, school administrators, teachers, parents, and students can harness this power" (Canady & Rettig, 1995b, p. 12). It is my estimate that every two of three schools, elementary through high school, are using some form of blocking or alternative scheduling practices. From the first one-room schools to the most modern, schools within schools, have blocked a particular period of extended time for a specific subject. It may not have been called block scheduling, but in essence, it was blocking. This has been especially true in elementary schools where large sections of time exceeding 60 minutes have been used to block language arts or mathematics.

Visit my website for using block scheduling in the upper elementary grades.

EIGHT



Aligning Standards and Course Content

Curriculum alignment is an essential element in the total success of implementing the block. The first elements in curriculum alignment include scoping out and sequencing the units or content to be taught.

In sequencing, educators examine the order of information or skills that must be taught to achieve the desired outcomes. For example, in the language arts program, teachers instruct readiness skills in reading at kindergarten to basic skills in elementary and middle schools to English in the high school. Teachers strive to put content in a meaningful order. Some courses such as mathematics and science are sequential and require a step-by-step approach. In processing skills such as observing, comparing, and inferring, there can be a definite order in which higher-order processing skills are developed. In the sequencing, evident patterns emerge at various levels in the high school. In high school courses, the sequencing becomes extremely important, to include all of the desired content. Most subject content has been prescribed by the various state departments and the local boards of education. In most states, teachers will find biology being taught in the 10th grade; however, in other places, it may be taught in 11th or 9th grade. However, the scope of the content is similar. To be educationally sound, the material is taught in a sequence; the basic biology class is taught before advanced biology and usually before chemistry and physics courses. Once courses have been developed for scope and sequence, scheduling is the next step.

Scheduling is where administrators and curriculum leaders become involved in the process. Their role is to make sure that course offerings are presented at a particular time and offered on a regular basis to ensure all students the opportunity to take the classes. Scheduling becomes more important as we move from curriculum alignment to instructional alignment in that if the courses are not aligned in the schedule in the right fashion, it will be difficult to implement the desired curriculum.

MODELS FOR USE OF INSTRUCTIONAL TIME

As stated in Chapter 2, moving to a block schedule causes teachers to lose some overall instructional time that needs to be examined in the process of curriculum alignment. When realigning their courses with the curriculum, teachers can examine three basic models that will prove to be time wise and will allow for the maximum use of desired content. These include limiting content, assigning outside content, and integrating content.

Limiting Content

In these three approaches for curriculum alignment, the one often used as default is limiting the content. A decision is made to limit what is to be taught and to focus on the priorities of the course. Teachers tend to spend more time on the content they like and less on content they either dislike or have limited instructional materials for teaching.

The concept is similar to the concept of abandonment found in the effective schools research of the 1980s. Researchers found that to succeed in designing an effective school, some part of the content had to be abandoned to allow time to implement the remaining content in an orderly and appropriate fashion. When examining the abandonment model, we refer to this as the prioritizing approach. When analyzing any curricular model, whether from the state department, the local board, or even the textbook alone, teachers begin to plan what to teach in a course. They begin by listing their intended topics, usually in the order they plan to teach. (These usually have a sequence and may be skill related.) Many topics are arranged by units.

What teachers should be striving to do is eliminate, move, or modify the competencies or guidelines in curriculum. The first step in prioritization is to list or group patterns of concepts, units, or mini-units. The teacher prioritizes these as shown in Table 8.1. In the table, 12 basic groupings of items are presented. (These numbers will be more or less in most cases.) Sometimes we can do a factor analysis on this and break down the content in particular areas. In most cases, these are listed in the local curriculum. A goal may be to abandon two or three in the list of 12. In the block schedule, 10% to 15% of class time will be lost in the course of a year. In comparison, we find from our research and observations that teachers using traditional models often fail to use their time effectively and are teaching beyond the prescribed curriculum. Therefore, although some

overall instructional time is lost in the block schedule, the abandonment model and the use of various instructional models will actually cause an increase in interactive learning time. For example, one can focus on a total of 12 concepts for the course and decide to abandon two components that could be eliminated from the course. Often, this is material that has been added by the teacher over the years. Teachers implement the curriculum but should not add to the curriculum. In a case where the curriculum is tightly outlined and the teacher strives to cover all material, he or she may choose one or two areas where similar competencies may be combined and taught simultaneously. For example, the Civil War and the Revolutionary War competencies may be taught together within the concepts of restoration. In the English classroom, epic poetry may be taught as a part of a general poetry unit. I recommend that teachers find two or more concepts to abandon or combine with similar items.

Notes to Remember

1. Teachers must not use the abandonment model to cut required content or competencies. The only content that should be abandoned may include superfluous examples, excess content, or information outside the content area that teachers may have added over the years.

2. Group competencies together that may be taught in one unit instead of separate lessons, such as process skills or English short stories. Two or three short stories will enable students to understand selected literary terms and the general concept of short stories. It is not necessary to inundate them with 10 or more short stories.

3. Isolate the strengths and weaknesses of teaching styles, content examples, and student ability. Create recommendations to deal with the weaknesses.

Assigning Outside Content

Assigning outside content is the second curriculum alignment model. With this approach, the teacher assigns content to students to investigate on their own or in pairs or groups outside class. Creative teachers use course contracts or instructional packages for students to complete this content by, for example, clarifying in their course syllabus specifically what

Table 8.1. Prioritization in Ninth-Grade English

9th-Grade English – Abandonment			
Speech	~~Epic Poems~~	Film	~~Advertising~~
Poetry	Technology	Drama	Short Story
Fiction	Nonfiction	Research	Novel

must be completed outside class. Students often keep portfolios and/or journals to respond to share the content with the teachers. An excellent example would be that a student reads a novel that cannot be covered in class, but the teacher wants to hold the student responsible for the content.

Pretend there are 12 blocks of similar items, such as units or skills, content, and various situations or classes. In this model, the content is blocked and placed in order. Teachers can mark their use as "T" for teacher directed, "T/S" for teacher and student directed, and "S" for student directed (Table 8.2). Most will be teacher directed, meaning that the teacher plans to include this content within the course. The teacher will be responsible for preparing all the material. There may be an area where teachers and students can share teaching. The teacher could start a basic content, such as pollution, and have students research thermal, water, and air pollution. Learning stations, product or instructional packages, use of contracts, use of library—all are helpful to responsible students and also serve as good tools. The teacher provides perimeters and materials. This works well when students work on this over a period of time, alone or with peers. The student is held accountable for the content, and the assignments can be completed as cooperative projects. In my opinion, only 10% of the content should ever be taught in a student-directed manner. Another alternative would be to use the T/S, giving teachers more variety and flexibility in selecting contents.

Integrating Content: C–Clustering

The integrating model, which groups, or clusters, subject content, is shown in Table 8.3. The same 12 items are used as in Table 8.2. This model is known as the thematic approach. The 12 items are clustered into three categories or themes patterns, three basic sections of the course. These three major units may be carried over a long period of time.

Content is merged into a more meaningful pattern. For example, in a U.S. history course, there could be a grouping of wars. All the content of war can be taught in one long cluster to look for patterns of prewar climate, the political manifestations, causes, restoration, and postwar reconstruction. In a master plan or unit on war, timelines should be drawn and posted for students to see the sequence of time. To compare the similarities

Table 8.2. Assigning Outside Content in Ninth-Grade English

9th-Grade English–Blocking			
Speech T/S	Epic poems T	Film S	Advertising S
Poetry T	Technology T	Drama S	Short Story T/S
Fiction T	Nonfiction T	Research S	Novel T/S

Table 8.3. Integrating Content in Ninth-Grade English

9th-Grade English–Clustering

Unit 1: Literature	Unit 2: Communication Skills	Unit 3: Media & Technology
Fiction	Research Writing	Advertising
Novel	Speech	Technical Writing
Nonfiction	Creative Writing	Electronic Research Methods
Poetry	Formal Presentations	

of the various wars, highlight mini-themes or curricular threads, such as politicians, taxation, and so on. In an English classroom, a cluster of media and technology could group together computer technology, advertising, and film. The cross correlation among these topics can result in student investigations into advertising on the Internet, in films, and in print media. Selecting content is difficult in the beginning; however, this approach is compelling when students see the relevance of what they are learning and how information may be linked. This approach can be implemented to focus on higher-order thinking skills. Weaknesses may occur in not being able to see the chronological order of events.

As teachers begin to redesign their courses from a traditional schedule to the block model, the following steps and related forms can be used. Sample models are included in the figures in Chapter 9 in the two subject areas of geometry and French II.

CURRICULUM ALIGNMENT AND INSTRUCTIONAL PACING

Curriculum Alignment Phase 1

Step 1: Scope out the course as it has been taught in the traditional schedule (see Figures 9.1–9.3).

Step 2: Place a minus sign over one or two areas or units on which you spent more time than you intended in the traditional model. Usually we do this when we have more materials or we like this part of the content more.

Step 3: Place a plus sign over one or two areas or units on which you spent less time than you intended or that you were unable to get to in the traditional model.

Step 4: Now mark the amount of time IN DAYS that you have used compared to time used for the traditional use for each unit. For example, 10 days on the introduction of the animal cell. Scope out each unit with respect to time needed for the traditional schedule.

Step 5: Now mark each unit using the following formula: For the areas in a unit not marked with a plus or minus sign, divide the number of days in a traditional schedule for the unit by half to determine how much time to spend in a blocked schedule on those areas; for the areas on which you spent more time (areas with a minus sign), divide by half and subtract one day to determine how much time to spend; and for the areas that you spent less time on (areas with a plus sign) divide by half and add one day to determine how much time to spend. This is one way to help teachers begin realigning their courses. This is refined in Phase 2.

Curriculum Alignment Phase 2

Step 1: Further develop each unit according to the content on the Phase 2 form (see Figures 9.4–9.6). List content, vocabulary, and other material to be covered in the unit. Mark items that may be learned outside class in an alternative assignment. Make any notes that will help you organize your instructional plan or pacing.

Step 2: From the above formulas, begin further prioritizing content to be taught.

Mark areas where some content must be limited, assigned outside class, or integrated with other content. At this stage, don't worry about the instructional processes or activities that will be used in or out of class. We will complete this element in the pacing process, which follows. NOTE: Use a pencil with all of this because you will be making changes as you develop the plan.

Instructional Pacing Phase 1

Step 1: Transfer the topics from Phase 2 of curriculum alignment to Phase 1 of instructional pacing. Use a day-by-day approach in the transfer (see Figures 9.7-9.9).

Step 2: Keep Days 3 and 8 as "safe days." These are days that no instruction is planned because over 90% of teachers are behind at these days, and this allows them to get caught up and feel less frustrated. I recommend that a half day for catching up be included every week thereafter. If you are one of the few who are not to behind, just go to the next day of the plan and you are ahead. Keep the last three or four days as safe days for reviewing, catching up, and exams. Most teachers actually teach about 86 to 87 days per 90-day semester.

Step 3: Now that you have safe days to include, be sure to revisit the actual days planned and make adjustments. This may change again as you select specific activities to use for teaching. That is why it is important to be very processed oriented with this approach. Move now to the last stage, which is Phase 2 of instructional pacing.

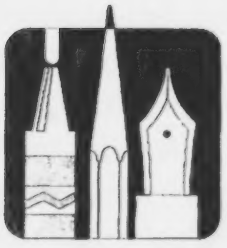
Instructional Pacing Phase 2

Step 1: Use this model as a weekly and daily lesson plan. Complete the content information as shown in the samples in Chapter 9 and then project activities that you will be using by minutes on a daily level (see Figures 9.10–9.12). It is important that you have the first three weeks of lessons completed before the students arrive and that you remain three weeks ahead throughout the semester or year. Most teachers use one day per lesson, but it is important to know that some lessons may exceed one day or that there may be two lessons in one day.

Step 2: As you learn more about interactive methods and assessment, you will have to make adjustments in your plan.

IMPORTANT NOTE: This is a well-tested procedure that has been used by thousands of teachers in the United States to develop appropriate pacing of instruction. Do not take any of the steps lightly, or you will have difficulty pacing and being successful. Of equal importance, it will make your planning and teaching less stressful, and by the second and third time you teach the course and make appropriate modifications, you will have a master plan.

NINE



Samples of Curriculum Alignment and Pacing

In this chapter, you will find blank forms and samples for curriculum alignment and pacing. The figures in this chapter are grouped according to phases. Each group of figures contains a blank form and two completed samples. Use them as shown or adapt them as necessary. It is my hope that these pages will enhance the information presented in Chapter 8 and ease your journey into block scheduling.

The first step in aligning curriculum for block scheduling involves modifying a unit of study from the traditional schedule so that it can be taught in the block schedule. Figures 9.1, 9.2, and 9.3 address courses as they have been taught in the traditional schedule. Figure 9.1 is a blank form for teacher use and Figures 9.2 and 9.3 are samples of completed forms. For more detailed instructions, refer to Chapter 8, pages 69-70, Curriculum Alignment Phase 1, Step 1-5.

A	B	C	D	E	F
G	H	I	J	K	L

Figure 9.1. Curriculum Alignment: Phase 1 Form

A	B	C	D	E	F
Points, lines, planes, and angles	Deductive reasoning	Parallel lines and planes	Congruent triangles	Quadrilaterals	Similar polygons
Right triangles	Circles	Areas of plane figures	Surface area and volume	Coordinate geometry	Transformations
G	H	I	J	K	L

Figure 9.2. Curriculum Alignment: Phase 1—Geometry Sample

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Subject: French II
Grade Level: 10-12
Teacher(s): _____

A	B	C	D	E	F	G	H	I	J	K	L
Describing your city	Finding your way around	Describing your home and family	Making plans to do things in town	Talking about clothes	Discussing shopping plans	Buying clothes	Discussing leisure activities	Describing vacation travel plans	Narrating what happened	Talking about your favorite foods	Shopping for food
Planning a meal	Eating out with friends										

M	N	O	P	Q	R	S	T	U	V	W	X

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Figure 9.3. Curriculum Alignment: Phase 1—French II

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Figures 9.4, 9.5, and 9.6 are for Phase 2 of curriculum alignment. They are used to further refine the content and materials of the unit of study. See page 70, Curriculum Alignment Phase 2, Steps 1 and 2, in Chapter 8 for detailed instructions.

Subject _____

Grade Level _____

Teacher(s) _____

Goal/Topic

1	2	3	4
Notes:	Notes:	Notes:	Notes:
(a)	(a)	(a)	(a)
(b)	(b)	(b)	(b)
(c)	(c)	(c)	(c)
(d)	(d)	(d)	(d)

Figure 9.4. Curriculum Alignment: Phase 2 Form

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Subject: Geometry
Grade Level: 9-12

Goal/Topic

Points, Lines, Planes, and Angles

Points, Lines, and Planes	**Segments, Rays, and Distance**	**The Coordinate Plane**	**Angles**
1	**2**	**3**	**4**
(a)	(a)	(a)	(a)
(b)	(b)	(b)	(b)
(c)	(c)	(c)	(c)
(d)	(d)	(d)	(d)

Figure 9.5. Curriculum Alignment: Phase 2—Geometry Example

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Subject: French II
Grade Level: 9-12

Goal/Topic

Describing Your City

1	2	3	4	5	6	7	8	9	10
Streets and public buildings 28.B.2b	Places you often go to 28.D.2a	How you get around 28.B.3a							

Goal/Topic

Finding Your Way Around

1	2	3	4	5	6	7	8	9	10
Asking and giving directions 28.B.3a	Indicating the floor 28.D.2a								

Goal/Topic

Describing Your Home and Family

1	2	3	4	5	6	7	8	9	10
Your address 28.D.2a	The inside and outside of your home 28.D.2a	Your family 28.D.2b							

Figure 9.6. Curriculum Alignment: Phase 2—French Sample

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Figures 9.7, 9.8, and 9.9 are used for Phase 1 of instructional pacing. The topics from curriculum alignment Phase 2 are transferred day-by-day to this form. See pages 70-71, Instructional Pacing Phase 1, Steps 1-3 in Chapter 8 for detailed instructions.

Subject _____ **Teacher** _____

Day	Topics/Goals/Objectives	Textbook/Materials/Resources
1.		
2.		
3.	Safe day	
4.		
5.		
6.		
7.		
8.	Safe day	
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		
17.		
18.	½ Safe day	
19.		
20.		

Figure 9.7. Pacing: Phase 1 Form

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Day	Topics/Goals/Objectives	Textbook/Materials/Resources
21.		
22.		
23.		
24.		
25.		
26.		
27.		
28.	Safe day	
29.		
30.		
31.		
32.		
33.		
34.		
35.		
36.		
37.		
38.		
39.		
40.		
41.		
42.		
43.	Safe day	
44.		
45.		

Figure 9.7. Continued

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Day	Topics/Goals/Objectives	Textbook/Materials/Resources
46.		
47.		
48.		
49.		
50.		
51.		
52.		
53.		
54.		
55.		
56.		
57.		
58.		
59.		
60.		
61.		
62.		
63.		
64.		
65.		
66.		
67.		
68.		
69.		
70.		

Figure 9.7. Continued

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Day	Topics/Goals/Objectives	Textbook/Materials/Resources
71.		
72.		
73.		
74.		
75.		
76.		
77.		
78.		
79.		
80.		
81.		
82.		
83.	Safe day	
84.	Safe day	
85.	Review	
86.	Review	
87.	Safe day	
88.	Unit 8 test	
89.	Safe day	
90.	Safe day	

Figure 9.7. Continued

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Subject: Geometry **Teacher** _____

Day	Topics/Goals/Objectives	Textbook/Materials/Resources
1.	Points, lines, and planes	Geometry figures poster
2.	Segments, rays, and distance	Geometry figures poster
3.	Safe day	
4.	The coordinate plane	
5.	Angles	Protractors
6.	Review	
7.	Unit 1 test If-then statements, converses	
8.	Safe day	
9.	If-then statements, inverses and contrapositives	
10.	Properties from algebra, Introduction to proof	
11.	Midpoint, angle bisector	
12.	Special pairs of angles	
13.	Perpendicular lines	
14.	Mixed practice	
15.	More on proofs	
16.	Review	
17.	Unit 2 test Terms in parallel lines and planes	
18.	½ safe day	
19.	Properties of parallel lines	
20.	Properties of parallel lines cont'd	

Figure 9.8. Pacing: Phase 1—Geometry Sample

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Day	Topics/Goals/Objectives	Textbook/Materials/Resources
21.	Proving lines parallel	
22.	Angles of a triangle	
23.	Angles of a triangle cont'd	
24.	Angles of a polygon	
25.	Review	
26.	Unit 3 test Congruent figures	
27.	3 ways to prove triangles Congruent: SSS, SAS, ASA	
28.	Congruent triangles and proof	
29.	Congruent triangles and proof cont'd	
30.	Isosceles triangles	
31.	2 more ways to prove triangle congruent: AAS, HL	
32.	Proving triangles congruent practice	
33.	Medians, altitudes, and perpendicular bisectors	
34.	Review	
35.	Unit 4 test Algebra review: quadratics	
36.	Properties of parallelograms	
37.	Ways to prove quadrilaterals are parallelograms	
38.	Parallelogram practice	
39.	Theorems involving parallel lines	
40.	Special parallelograms	
41.	Special parallelograms cont'd	
42.	Trapezoids	

Figure 9.8. Continued

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Day	Topics/Goals/Objectives	Textbook/Materials/Resources
43.	½ safe day	
44.	Review	
45.	Unit 5 test Algebra review: fractions	
46.	Ratio and proportion	
47.	Properties of proportion	
48.	Similar polygons	
49.	Similar polygons cont'd	
50.	A way to prove triangles similar: AA	
51.	2 more ways to prove triangles similar: SAS, SSS	
52.	Proving triangles similar practice	
53.	Proportional lengths	
54.	Proportional lengths cont'd	
55.	Review	
56.	Unit 6 test Algebra review: radicals	
57.	Simplifying radicals Similarity in right triangles	
58.	Similarity in right triangles cont'd Pythagorean theorem	
59.	The converse of the Pythagorean theorem	
60.	Special right triangles	

Figure 9.8. Continued

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Subject: French II **Teacher:**_____

Day	Topic/Goal	Textbook/Materials Resources	Strategies
1. 2. 3. 4. 5. 6.	Describing your city, directions, address, and your house Safe day	Lesson 21, pp. 188-197	Diagram of house
7. 8. 9. 10. 11. 12.	Things to do Verb *aller* Safe Day Places you go How you get around	Lesson 22, pp. 198-209	
13. 14. 15. 16. 17. 18.	Asking others to come along Saying where you have been Contradicting someone Expressing surprise	Lesson 23, pp. 210-219	

Figure 9.9. Pacing: Phase One

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Day	Topic/Goal	Textbook/Materials Resources	Strategies
19.	Making plans to do things in town	Lesson 24, pp. 220-229	
20.	Expressing doubt Your family		
21.	Unit 6	Lesson 24 (Suite)	
22.			
23.			
24.			
25.	Review		
26.	Unit 6 Test		
27.	Padding		
28.	Padding		
29.	Talking about clothes	Lesson 25, pp. 246-255	
30.	What people are wearing		
31.	Whether their clothes		
32.	fit		
33.	Where to go asking for help		
34.			

Figure 9.9. Continued

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Day	Topic/Goal	Textbook/Materials Resources	Strategies
35.	Discussing shopping plans	Lesson 26, pp. 256-265	
36.	What to buy		
37.	Emphasizing a remark		
38.			
39.			
40.			
41.	Paying for clothes	Lesson 27, pp. 266-273	
42.	What clothes look like		
43.	Deciding what to choose		
44.	Comparing time		
45.	Introducing an opinion		
46.			
47.	Clothing	Lesson 28, pp.274-285	
48.	Where to go		
49.	Finding out price		
50.	Talking about what you would like		
51.			
52.			
53.			

Figure 9.9. Continued

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Day	Topic/Goal	Textbook/Materials Resources	Strategies
54.	Review		
55.	Unit 7 Test		
56.	Padding		
57.	Discussing leisure activities	Lesson 29, pp. 296-305	
58.	Going out with friends		
59.	Sports		
60.	Helping around the house		
61.			
62.			
63.	Describing vacation plans	Lesson 30, pp.306-317	
64.	How you and others feel		
65.			
66.			
67.			
68.			
69.	Narrating what happened	Lesson 31, pp. 318-327	
70.	How long to stay		
71.	What to see		
72.			
73.			
74.			

Figure 9.9. Continued

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Day	Topic/Goal	Textbook/Materials Resources	Strategies
75.	Narrating what happened	Lesson 32, pp.328-337	
76.	Things you never do		
77.	Travel dates		
78.	Where you went and		
79.	when you returned		
80.			
81.			
82.			
83.	Safe day		
84.	Safe day		
85.	Review		
86.	Review		
87.	Safe day		
88.	Unit 8 test		
89.	Safe day		
90.	Safe day		

Notes_____

Figure 9.9. Continued

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Use the samples and blank forms to complete Phase 2 of instructional pacing. Phase 2 is completion of daily and weekly lesson plans. See page 71, Instructional Pacing Phase 2, Steps 1 and 2 of Chapter 8 for detailed instructions on completing the forms.

Time Period
Day(s) _____

CONTENT FOCUS		REQUIRED RESOURCES
DESIRED OUTCOME(S)/OBJECTIVE(S)		**ASSESSMENT/EVALUATION**
DESCRIPTION OF ACTIVITIES/PROCEDURES		

Figure 9.10. Pacing: Phase 2 Form

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TIME LINE (Minutes)				
DAY 0	20	40	60	80
5	25	45	65	85
10	30	50	70	90
15	35	55	75	
DAY 0	20	40	60	80
5	25	45	65	85
10	30	50	70	90
15	35	55	75	
DAY 0	20	40	60	80
5	25	45	65	85
10	30	50	70	90
15	35	55	75	
DAY 0	20	40	60	80
5	25	45	65	85
10	30	50	70	90
15	35	55	75	
DAY 0	20	40	60	80
5	25	45	65	85
10	30	50	70	90
15	35	55	75	

Figure 9.10. Continued

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Time Period
Dates: _____

CONTENT FOCUS (1)	REQUIRED RESOURCES (4)
Segments, rays, and distance	Geometry figures poster
SPECIFIC OBJECTIVES (2)	**STUDENT ASSESSMENT (5)**
Identify, name, and draw	Transparency questions Decoding activity—distance on a number line
DESCRIPTION OF ACTIVITIES/PROCEDURES (3)	
Review key points from previous lesson. Short lecture with transparency sample questions. Guided practice. Small assessment of transparency questions for groups of 3-4 students. Decoding activity dealing with calculating distance on a number line. Teacher points to a geometric figure on a large poster and asks students to name it without giving the students any information about the figures prior to discussion. Review of the day's lesson.	

Figure 9.11. Pacing: Phase 2—Geometry Sample

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DAY 1 IN MINUTE INTERVALS				
0 Review 5 10 15 Definitions and examples of terms	20 25 30 35	40 Student practice (transparency ?s) 45 50 Decoding activity (distance on a # line) 55	60 Check student work 65 70 75 Poster	80 85 Summary 90
DAY 0 5 10 15	20 25 30 35	40 45 50 55	60 65 70 75	80 85 90
DAY 0 5 10 15	20 25 30 35	40 45 50 55	60 65 70 75	80 85 90
DAY 0 5 10 15	20 25 30 35	40 45 50 55	60 65 70 75	80 85 90
DAY 0 5 10 15	20 25 30 35	40 45 50 55	60 65 70 75	80 85 90

Figure 9.11. Continued

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Time Period
Day(s): 1-5

CONTENT ANALYSIS AND FOCUS		REQUIRED RESOURCES
Describing your city Finding your way around Describing your home		Textbook Workbook
DESIRED OUTCOME(S)/OBJECTIVE(S)		**ASSESSMENT/EVALUATION**
Students will learn to describe building, asked to give directions, describe their house		Graded interviews Graded group exercises Drawing of house Composition—written description of house Map of city
DESCRIPTION OF ACTIVITIES/PROCEDURES		
Lecture discussion Paired exercises Composition Drawing	Generating conversations from drawings	

Figure 9.12. Pacing: Phase 2—French II

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DAY 0	Rules & expectation	20	Students reintroduce	40	Read over p. 188 French cities	60			
5		25	themselves—name,	45		65		80	
1			where from, age,						
10		30	interesting facts	50		70		85	
15		35		55		75		90	
DAY 0	Students draw	20	Identify the building	40	Vocab. p. 190	60			Present
2	bldgs. in their		in French						interviews
5	cities	25		45		65	Work in pairs	80	
2							Interviews	85	
10		30		50		70	p. 190	90	
					Ex. 1, p. 190				
15		35		55		75			
DAY 0	Do Ex. 1, p. 181	20	pp. 165-166	40	Ex. 3-4, p. 192	60			Present group
3	Wkbk. Cassette							80	exercise to class
5	A-B	25		45		65			
3			Divide class in		Asking directions			85	
10		30	half—one asks, the	50		70	Pairs Ex. 5,		
			other answers				p. 193	90	
15		35		55		75			

Figure 9.12. Continued

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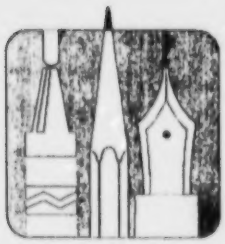
TEN



Effective Instructional Strategies for Block Scheduling

To be a successful teacher in a blocked class, Robert Algozzine, Martin Eaddy, and I (Queen, Algozzine, & Eaddy, 1997) concluded that the most important teaching skills for instruction are as follows:

1. The ability to develop a pacing guide for the course in nine-week periods, including weekly and daily planning
2. The ability to use several instructional strategies effectively
3. The skill to design and maintain an environment that allows for great flexibility and creativity
4. The desire and skill to be an effective classroom manager
5. The freedom to share the ownership of teaching and learning with the students

In another study, while we (Queen, Algozzine, & Isenhour, 1999) found that it was important that all teachers master the preceding skills, we discovered that beginning teachers need special attention from mentors and principals. This was most evident in the area of effective classroom management.

Principals and staff development personnel must provide initial and continuous training for teachers to master instructional strategies. Cooperative learning, synectics, Paideia seminars, concept attainment, case method, inquiry methods, simulations, games and role-playing strategies are excellent methods for teachers to use in blocked classes. Jenny Burrell, Stephanie McManus, and I (Queen, Burrell, & McManus, 2000) identified and reviewed several strategies in *Planning for Instruction: A Year Long Guide*. However, just as a 90-minute lecture is inappropriate, a 90-minute discussion session may be too long. We found that teachers should change activities every 10 or 15 minutes. This will prevent student boredom, encourage class interaction, and promote teaching to the needs of diverse learners. Instruction in these extended periods should begin with a review, include various activities, and conclude with an adequate summary. Briefly described below are some instructional strategies that teachers should be aware of and trained to use for teaching in the block. These instructional approaches are presented in greater detail in *The 4x4 Block Schedule* (Queen & Isenhour, 1998b).

COOPERATIVE LEARNING

Cooperative learning, developed by Slavin in the early 1980s, is a very useful teaching method and classroom management tool (Slavin, 1987). A block schedule allows for group meetings, various grouping structures, and team presentations. Cooperative groups can include competitive subject reviews or timely coverage of material. Groups can be created by a random selection or a prescribed mix established by the teacher. For specialized activities, cooperative groups can be formed by the students. For optimal benefits, groups should stay together for at least four weeks. However, many class activities call for quick group formations. Limiting the time periods for groups can decrease problems resulting from personality conflicts within the groups.

For the most efficient use of time while grouping, teachers must inform students of the objective of their work together and explain the grading procedures that will be used for evaluating their performance. Group members should have an individual set of responsibilities and be held accountable for their actions in all activities. The teacher and students evaluate performance using self, peer, and teacher assessment in a cooperative evaluation model.

Cooperative learning can be structured in a variety of ways for a block schedule. However, inappropriate use of cooperative groups can lead to increased discipline problems and may result in excessive student competition. I believe the most effective grouping structure is the "jigsaw" method. In a jigsaw, each student prepares an assigned activity, then meets with the group to teach or inform other members. Each student has individual accountability and special responsibility to listen and learn the new material from the other group members. Another approach used is the

project groups. Groups are assigned a specified project to analyze completely or a specific problem to solve. Project groups conclude with a presentation to the class and, often, written documentation of the project. I find that this type of group construct works well with the case method.

THE CASE METHOD

The case method is used to stress introspection, higher-order thinking, and individual accountability. It also creates the type of layered class structure needed in a block schedule. Once the initial narrative or case is presented to the class, individual students sign contracts for their roles in the case study. Groups negotiate with the teacher for final presentations, meet for daily discussions, or seek guidance for research. Portfolio development is possible on an individual and group basis. Many different activities can be incorporated into the case, which achieves the variability aim of teachers in the block. For example, a case study on Thomas Jefferson in a history class can include individual research projects, a jigsaw share of expert knowledge, group presentations on contemporary leaders, and Socratic seminars on several of Jefferson's accomplishments (Queen & Isenhour, 1998b).

SOCRATIC SEMINAR

In 1982, Mortimer Adler introduced *The Paideia Proposal* by using a group discussion model that can be easily incorporated into a blocked class. Each member of the class reads a selection from the material provided by the teacher prior to the seminar. The teacher avoids directing the discussion of the seminar. The teacher's role is to record the participation and degree of preparedness of each participating student. Students are instructed to explore their ideas about a particular topic and question other members of the class in an open discussion. Students thrive in these seminars once they discover that their opinion is valued and that the teacher is not searching for a specific, "right answer." The teacher usually asks the first question, or it can be elicited from a student experienced with the seminar format. Teachers avoid evaluation, direct the discussion toward topic relevancy, and clarify arguments if there seems to be no solution. The Socratic seminar often leads to further issues, thus extending the learning opportunities beyond one classroom discussion.

SYNECTICS

Through the use of metaphor, Gordon in the early 1960s developed an approach by which students learn to associate a new topic with prior experience (Gordon, 1961). In analogy form, the teacher asks students to

describe the similarities between a given topic (the concept) and some unrelated item (the analogue). For example, a biology teacher may ask her students to describe the similarities between the parts of an animal cell and the parts of a city. After reviewing these similarities, students are asked to "become" the concepts and analogues by using first-person statements of feeling. The teacher may elicit statements such as "I feel strong when my cell membrane keeps out impurities," or "I am the nucleus and I feel very powerful." If obvious differences exist between the topic and the comparative element, the teacher may address these differences while being careful not to destroy the link previously made. Finally, students create their own new analogies to better retain the original concepts. This method serves well as a review activity and can be a valuable tool in assisting students to retain facts and concepts.

CONCEPT ATTAINMENT

In the concept attainment model, initially developed by Bruner in the early 1960s, teachers prepare and present a series of positive and negative examples in order to lead students to a definition of a concept and its essential attributes (Bruner, 1966). After the teacher presents the students with the first set of examples, students brainstorm a list of similarities between the positive examples and formulate a definition of the concept. The teacher then presents the students with a second set of examples for the students to test their predictions. The final concept is gradually attained by students who develop a greater understanding of the concept than if they were merely expected to memorize it from a lecture or book. Joyce, Weil, and Calhoun (2000) continue to advance different formats of the model.

INQUIRY METHOD

In using the inquiry method, the teacher presents students with a problem to solve using the scientific process. Students gather data by posing yes-no questions to the teacher and use their results to formulate a theory on relationships or the solution to the problem presented. Typically, as Eggen and Kauchak state in *Strategies for Teachers* (2001), inquiry is using facts and observations to solve problems. The teacher then directs the students to test their theories and discuss the steps used to solve the problem. Inquiry is an attention-getting approach useful as an anticipatory set and often works well at the beginning of an extended period. Teachers using inquiry can become masters at asking thought-provoking questions. Inquiry can lead to group or individual study and may serve as the motivational element for a case study.

SIMULATIONS

Simulations can be used in a blocked class to create the effect or reality of a real situation or experience. Students participate in simulations of the real world by solving problems, completing developed packages of materials, or taking part in organized role-playing. Because of the extended time in a blocked class, students use short field trips to related sites as a part of simulations without being absent from an entire school day. Games, while more competitive than simulations and role-playing, are often included in the simulation family. Although it takes more time to plan, design, and implement a simulation, the increased student motivation and involvement are well worth the investment for greater student learning.

RECOMMENDATIONS FOR IMPROVING BLOCK SCHEDULING FOR THE FUTURE

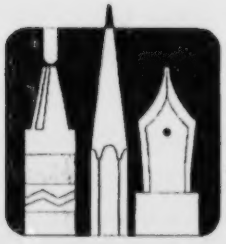
Listed below are important recommendations for maximizing the positive effects of block scheduling:

1. Teachers must develop and follow monthly, weekly, and daily pacing guides.
2. Teachers must master a minimum of five instructional strategies that engage students directly in the learning process and should aim to master seven or eight strategies.
3. Teachers should pace each lesson by changing grouping patterns, varying presentations, and using different instructional activities every 10 to 15 minutes. In most cases, a teacher should use a minimum of three instructional strategies during any period.
4. Teachers should incorporate alternative and authentic assessment practices when evaluating students.
5. Teachers must use the entire class period for instruction. Every day. Period!
6. Teachers should strive to be creative and flexible in assigning activities.
7. Teachers should coordinate and incorporate outside assignments into regular classroom activities.
8. Teachers should monitor individual students consistently to be sure of total student participation.
9. Teachers should mentor, formally or informally, beginning teachers and veteran teachers having difficulty with instruction in block scheduling.

10. Principals (and/or staff development personnel) must provide continuous staff development for all teachers throughout the year on the topics of curriculum/instructional alignment, instructional pacing and strategies, and time management.
11. Principals must develop a monitoring team to verify that all teachers are using pacing guides, instructional strategies, and class periods effectively.
12. Principals must take appropriate disciplinary action with teachers unwilling to follow the basic principles and procedures necessary in block scheduling.
13. Principals should work with less effective teachers in the development of an instructional improvement plan.
14. Superintendents should contact colleges of education in their regions and demand that block scheduling methods be included in teacher and principal training programs.
15. Superintendents should require that before schools move to a block scheduling format that principals and teachers spend from one to two years in effective staff development. (Queen, 2000)

In essence, the success of block scheduling depends greatly on the professionals who implement the model in their schools. It is imperative that the teachers, principals, students, and parents give the same attention and effort to block scheduling that they would to any other school schedule. Using instructional methods effectively will assist students to learn at an optimal level, as affirmed by Joyce et al. in the 2000 edition of their book *Models of Teaching*. Thoughtful planning, organization, implementation, and evaluation are imperative to maximize success in the block. All shareholders involved in education must provide the opportunity for the continued improvement of a scheduling format that has great potential for increased success in the future.

ELEVEN



Teacher-Directed Instruction

Direct instruction is a teaching method in which teachers direct the instruction from one lesson to the next within a fixed time period. It is sometimes referred to as a formal lesson. Direct instruction has come to have a number of different meanings, ranging from a type of classroom management system to any type of structured teaching to a set of specific steps to be followed in teaching a lesson. This instructional strategy is widely used and is a member of the behavioral systems family. In teaching models that have developed from the behavioral family, the focus is on the definition of the task and the analysis of the task. "Analysis of the task" refers, in this sense, to approaching the task from the perspective of the learner. The instructional design principles proposed in models such as direct instruction focus on (a) conceptualizing learner performance into goals and tasks, (b) breaking these tasks into smaller component tasks, (c) developing training activities that ensure mastery of each subcomponent, and (d) arranging the entire learning situation into sequences that ensure adequate transfer from one component to another and achievement of prerequisite learning before more advanced learning (Joyce, Weil, & Calhoun, 2000).

DIRECT INSTRUCTION AS A TEACHING MODEL

Direct instruction is a teaching model that places a great deal of emphasis on the completion of academic tasks. Its purpose is to maximize student

learning and to achieve a high rate of student success. Direct instruction involves a high degree of teacher control and high expectations for student progress. One of the major goals of direct instruction is to maximize learning time. When using direct instruction, the teacher arranges the learning environment so that there can be a predominant focus on learning.

As mentioned earlier, direct instruction is primarily teacher directed, and that is a factor in determining how it is used. The teacher is responsible for asking the questions in the lesson and leading the student to the desired answers. This is one reason it is recommended that direct instruction not be used as the only method of instructional delivery. It is most applicable to teaching a well-structured body of knowledge or the steps in a process or skill. It was once thought that direct instruction was beneficial only to young students, but recent studies have demonstrated that direct instruction may be successfully used for teaching skills such as comprehension in reading to both elementary and secondary students (Klesius & Searls, 1990).

The most common applications of direct instruction are in the study of basic information and skills in the core curriculum areas (Joyce et al., 2000). Recently, there has been a resurgence of interest in direct instruction. It has been touted as a successful way to teach ESL students—those for whom English is a second language. Direct instruction has been seen as extremely beneficial for those students identified as being from low socioeconomic status homes and therefore "at risk." Jere Brophy (1996) has suggested that direct instruction of social skills is an appropriate way to work with shy or withdrawn students.

The phrase "direct instruction" has been used by researchers to refer to a pattern of teaching that consists of the teacher's explaining a new concept or skill to a large group of students, having the students test their understanding by practicing the skill or concept under teacher direction, and encouraging them to practice under teacher guidance. In a direct instruction lesson, structuring comments are made at the beginning of the lesson. The comments may take the form of introductory activities that capture the students' attention immediately, or they may simply involve a discussion of the objective for the day's lesson. During the lesson introduction, the teacher provides explicit instructions for how the work is to be done. Then students are informed about the materials they will use and the activities they will work on. Finally, the teacher provides an overview of the lesson.

In direct instruction, the teacher often models a "finished product." The purpose of these introductory comments is to provide clarification for the student about what the procedures will be and the actual content of the lesson that is to follow. The next step is for the teacher to present the lesson. The teacher has decided in advance what information students are to learn. In the presentation portion of the lesson, the teacher explains the new concept, providing demonstrations and examples, along with the rules or definitions that help students to remember the concept. The teacher directs the questioning, always bringing the student to the correct answer. When

incorrect answers are given, there is immediate correction. After the presentation, the teacher demonstrates what he or she wants students to do in practicing what has just been taught. The teacher demonstrates each step in the correct order. When the teacher feels secure about the students' understanding, he or she assigns guided practice. This is an opportunity for students to practice the new learning under the teacher's guidance as the teacher circulates around the classroom, checking for student comprehension. The guided practice will be informally assessed so that the teacher is assured of student understanding. The aim is to master the skill. After this, independent practice is assigned. This is often done as homework. Whether the work is done as independent seatwork or at home, the objective is for the student to work independently. In a direct instruction lesson, the student works independently 50% to 75% of the time. The independent work is also assessed. The goal is 85% to 90% mastery.

The components of a direct instruction lesson design have appeared in other lesson designs as well. Dr. Madeline Hunter's (1982) research has shown that effective teachers have a methodology when planning and presenting a lesson. She has suggested various elements that might be considered in planning for effective instruction. In what has become known as the "Madeline Hunter model," we see the following elements:

- Anticipatory set
- Purpose
- Input
- Modeling
- Guided practice
- Checking for Understanding
- Independent practice
- Closure

It is not difficult to see the similarities in the design of a direct instruction lesson and the Madeline Hunter design. Others have also added to the basic lesson design of direct instruction, and direct instruction basics can be used in other teaching models. In fact, there are those who would argue that the components of direct instruction provide the background that is necessary before other models are used and that the lesson design can be used as a shell for any instructional lesson or unit.

The beginning of direct instruction is often credited to Siegfried "Ziggy" Englemann (Becker & Englemann, 1971). Englemann was a philosophy major who worked in the field of advertising. While exploring literature on the behalf of clients who marketed to children, he became interested in what type of input was required to induce retention of learning. Englemann began by working with small focus groups that included neighborhood children as well as his own sons. He outlined sequences of instruction that formed the nucleus for his later curricula. The early components of this sequence of instruction looked very much like the components of direct instruction today. Skills were precisely communicated in small bits, there was measurement to determine mastery, mistakes of

learners were quickly corrected, learners adhered to a strict schedule, and there was continual and repetitive review for the purpose of incorporating old material with new material. Englemann's early focus was on computational skills and phonetic skills. Eventually, Englemann's research was purchased by Scientific Research Associates (SRA), a division of McGraw-Hill, and was published in the form of kits that contained everything needed for presenting a lesson. The material was marketed under the trade name of DISTAR.[1]

In 1968, direct instruction enjoyed national attention for a brief time. Nixon's White House initiated a federal study called Project Follow Through. The Office of Economic Opportunity and the Office of Education joined forces to organize and fund this endeavor. The study was the largest controlled comparative study in pedagogical techniques in history, and its purpose was to work to isolate the "best practices" in education. The cost of the study was $1 billion.

At the same time that Englemann was publicizing information about direct instruction, Jean Piaget was expounding his theory of developmental learning. The two ideas were in direct opposition to each other. Becker and Englemann (1971) were positing that regardless of a student's age, if information was transferred in small enough bites and with enough repetition, learning could be accomplished. Piaget believed that even with the very best instruction, student learning would not occur until the student was developmentally ready.

DIRECT INSTRUCTION AS A CONTINUUM OF TEACHING BEHAVIORS

Several studies have shown that a strong academic focus produces greater student engagement and subsequent achievement (Joyce et al., 2000). Direct instruction plays a limited but important role in a comprehensive educational program. Some proponents of direct instruction say it is a way to target specifics of learning and to teach children what you want them to know. But opponents argue that direct instruction thwarts the development of higher-order thinking skills. One way for an educator to examine direct instruction is on a continuum. At one end of this continuum is the very directed and carefully sequenced lesson. This would be the type of lesson that one finds in materials such as Mastery Reading or other SRA publications. The lessons are scripted, and the teacher is taught how to signal for correct responses from the student. The questions asked are not open-ended, and there is one right answer that the teacher is seeking. The middle of this continuum is where one finds lessons such as the ones included in most textbooks. The lesson is partially scripted, and the students may be encouraged to think of different responses to questions, but the lesson is teacher directed, and the students are acquiring information in small bits. The learning theory is that the acquisition of small pieces of knowledge can eventually be constructed into the larger concept. At the

other end of the continuum is direct instruction used as an introductory mini-lesson in a writing workshop. The components of direct instruction are still there, but they are used as a part of the lesson, not as the whole lesson. The teacher directs the student to specific information that will assist in completing the rest of the lesson, which may actually use another instructional strategy.

Barak Rosenshine addressed the topic of direct instruction in 1978 at the annual meeting of the American Educational Research Association. He is credited with introducing the phrase "direct instruction" into the mainstream of educational research. When direct instruction was viewed at this time, Rosenshine had this to say:

> Direct [a concept] is related to the concept of academic engaged time. The term is relatively new, and apparently was developed independently by a number of researchers in the last three years. The meaning of the term is still being developed, and the definition is still loose. I use it to refer to those activities which are directly related to making progress in reading and mathematics and to those settings which promote those activities.
>
> . . . Direct instruction refers to levels of student engagement within classrooms using sequenced structured materials. . . . [D]irect instruction refers to teaching activities focused on academic matters where goals are clear to students, time allocated for instruction is sufficient and continuous; content covered is extensive; student performance is monitored; questions are at a low cognitive level and produce many correct responses; and feedback to students is immediate and academically oriented. In direct instruction the teacher controls instructional goals, chooses material appropriate for the student's ability level, and paces the instructional episode. Interaction is characterized as structured, but not authoritarian; rather, learning takes place in a convivial academic atmosphere. (Rosenshine, 1985)

As Rosenshine continued to research student achievement, he and others found that students acquire structures for learning when the following take place:

- Information is presented in small steps so that the working memory does not become overloaded.
- Students are helped to develop an organization for the new material.
- Students are guided through practice and given opportunities for extensive processing.
- Students are provided with cognitive strategies as they approach higher-level tasks.
- Students are given opportunities for extensive practice.

Direct instruction is a highly structured approach to teaching content, whether for math, history, or biology, in a highly structured environment in which the information is given to the students and they learn by prac-

ticing their knowledge under the teacher's direction until the content and associated skills are mastered. For instance, a teacher provides the information on how to balance a mathematical equation, and the students learn by practicing their knowledge. Rosenshine (1985) describes the process in steps, such as reviewing, stating the objective, modeling, providing numerous examples and reteaching. He and others have attempted to identify those teaching behaviors related to student achievement for the purpose of improving the quality of learning that takes place in school.

There is often disagreement about what constitutes a pitfall or a promise with direct instruction, depending on whether or not one sees merit in direct instruction as a method. Some see scripted lessons as evils that destroy the creative nature of the classroom. Proponents of the scripted lesson argue that there is no doubt that what is important will be conveyed to the student. With lessons of this nature, lesson plans are also available. Again, for some, this is a disadvantage, while others see a constructed lesson plan as a great time-saver and advantage. Direct instruction is by definition teacher-directed. Many educators feel that children learn best when the teacher tells them what they need to know. This kind of instruction has had a revival of popularity with the advent of high-stakes testing. As one would expect, opponents of direct instruction include those who regularly employ instructional strategies such as cooperative learning, discovery learning, and group investigation. However, direct instruction, as stated earlier, can be viewed on a continuum that allows movement away from the "all or none idea" to understanding the ways that direct instruction can become a part of any lesson. Student mistakes are corrected quickly in a direct instruction lesson, but some educators would argue that this is a negative. Direct instruction is easily evaluated, which is usually seen as an advantage for two reasons. First, most people have been taught by this traditional method, so it is familiar. Second, most evaluation instruments "fit" with this model. The components of a direct instruction lesson are not hidden; they are very obvious. Parent involvement is not emphasized in direct instruction. Many see this as negative, but it is one reason that direct instruction is seen as a strategy to be used in low socioeconomic populations and in ESL settings. In both situations, parents are often not capable of helping their child. No technology is necessary to teach a lesson using direct instruction.

SUMMARY

Direct instruction is a teaching model that is beneficial to students and that certainly has validity. It is important to remember that it is not a model to be used for all instructional delivery. Students will benefit from direct instruction but only up to a certain point. It is beneficial to student learning to balance direct instruction with models that encourage discovery of concepts and ideas. Models that engage students in more sophisticated cognition should be used as well.

The chapter ends with a sample lesson related to direct instruction titled, "Our Mr. Jefferson."

NOTE

1. Direct Instruction, a packaged learning program published by SRA but that was developed by Ziggy Englemann and supported by other researchers like Wes Becker (Becker & Englemann, 1971) should not be confused with direct instruction, a teaching strategy that has broad implications.

OUR MR. JEFFERSON: A SAMPLE TEACHER-DIRECTED LESSON

Following is a sample teacher-directed lesson. When delivering a directed lesson, it is important to have visuals to maintain the students' attention as well as to accommodate the visual learners in your classroom. For this lesson, one could use slides or pictures of Thomas Jefferson, the Jefferson Memorial, the Declaration of Independence, Monticello, and so on as part of the presentation of the material, which is broken into short sections of boxed text. Remember that, to be effective, the lesson must be well planned and focused, should not be more than 30 to 45 minutes in length, and should maintain students' motivation. In addition, check frequently for understanding and modify the pace accordingly.

LESSON TITLE: AN AMERICAN ENIGMA: THOMAS JEFFERSON

Sources: *Thomas Jefferson: An Intimate History*, by Fawn M. Brodie (1915–1981) and *American Sphinx: The Character of Thomas Jefferson*, by Joseph J. Ellis (1943–)

Who was the *real* Thomas Jefferson?

- If Thomas Jefferson were a monument, he would be the Sphinx
- If he were a painting, he would be the Mona Lisa
- If he were a character in a play, he would be Hamlet

Thomas Jefferson was . . .

- A violinist, farmer, scientist, lover of fine wines
- A restless architect who couldn't bring himself to ever finish building his home
- A politician with a voice so soft that he could barely make himself heard from the podium but who founded the first political party
- A man who denounced the moral bankruptcy he saw in Europe, but delighted in the gilded salons of Paris
- A statesman who was twice elected president of the United States but didn't think it worthy for the listing on his gravestone

Thomas Jefferson . . .

- Brought about fiscal stability to the country but died facing personal bankruptcy
- Was a lifelong champion of small government who took it upon himself to more than double the size of his country
- Endured the loss of nearly everything he held dear but somehow never lost his faith for the future
- Distilled a century of Enlightenment thinking into one remarkable sentence that began, "We hold these truths to be self-evident that all men are created equal" yet owned more than 200 human beings and never saw fit to free them

Early life

- Born in Albemarle County, Virginia on April 13, 1743
- Mother—Jane Randolph Jefferson
- Father—Peter Jefferson

Schooling

- Received a classical education with the Rev. Maury
- Attended William & Mary in Williamsburg and was influenced by
  William Small (mathematics, science, and philosophy)
  George Wythe (law)
  Governor Francis Fauquier (friend)

The beginnings of a patriot

- Colonists thought of themselves as British citizens with the privilege of British liberty
- Stamp Act of 1765—a dictate of a far-off parliament that had no colonial representatives
- Jefferson in the Virginia House of Burgesses—signed a boycott of British goods to end the "enslavement" of the colonists

As a young adult

- Practiced law for 7 years
- Married Martha Wayles Skelton on New Year's Day 1772
- Received land, slaves, and debt from his father-in-law

THE AMERICAN REVOLUTION

Before the Revolution

- 1774—Summary of the Rights of British America
- June 1775—Left for Philadelphia
- The Continental Congress and committee work
- Declaration of Independence
  "We hold these truths to be self-evident that all men are created equal, that they are endowed by their creator with certain inalienable rights, that among these are life, liberty and the pursuit of happiness."

During the Revolution

- House of Delegates in Virginia: Sponsored the law to overturn primogeniture and wrote the Establishment of Religious Freedom in Virginia
- Governor of Virginia
- Mentor of the next generation of statesmen: James Madison, James Monroe, William Short

After the Revolution

- Martha Jefferson died in September 1782
- 1784: Wrote *Notes on the State of Virginia*

Jefferson in Paris

- Went to Paris in 1784—took daughter Patsy and slave James Hemings
- Friendship with John & Abigail Adams
- Paris: A close view of monarchy and the salon society
- Daughter Polly comes to Paris, accompanied by slave Sally Hemings
- Maria Cosway: "My Head and My Heart" (letter to Maria on a dialogue between his head and his heart)

Secretary of State

- 1789: Secretary of State for Washington's administration
- Conflict: Alexander Hamilton
- Political parties: The Federalists vs. the Democratic-Republicans

Home to Monticello: Before returning to politics

- Monticello his home and safe haven
- Focused on his farm, his home, and his inventions
- 1786: Ran for president—became John Adams's vice president
- Opposed the Alien & Sedition Acts of 1798

Revolution of 1800

- 1800: Candidates for president: Adams, Pinkney, Jefferson, and Burr
- Election thrown into the House of Representatives
- A legacy of Federalists judges for the Jefferson administration

Jefferson as president . . .

- Worked to decrease federal spending
- Negotiated the Louisiana Purchase
- Sent Lewis & Clark and the Corps of Discovery to explore the West
- James Callender publishes rumors about Jefferson and Sally Hemings
- Daughter Polly dies—1804
- Imposed an embargo on exporting American goods and the economy suffers
- Endured a tormented second term
- Left Washington in 1809 for Monticello, never to return

Did He or Didn't He?

- Sally Hemings had five children: Tom, Beverly, Harriet, Madison, and Eston; all were reported to be mulattos
- Jefferson was present at Monticello nine months prior to the births of Sally's last four children; Sally was said to be in Paris when she became pregnant with her first child
- Jefferson's descendents claim that the father was one of the Carr brothers

Genetic evidence

- A man receives a "Y" chromosome from his father and an "X" chromosome from his mother.
- The Y chromosome has polymorphisms—the "glue" holding the actual genes together.
- Fathers pass on polymorphisms (the "glue"), which have specific characteristics, to their sons.
- If two men have identical polymorphisms, the chances are great that they have a common ancestor.
- Field Jefferson and Eston Hemmings had identical polymorphisms.

Retirement at Monticello

- His plants and garden
- Constant visitors
- A household with grandchildren

The North and South Poles of the Revolution

- 1812: James Madison negotiated a "truce" between John Adams and Jefferson
- 1812–1826: The most important correspondence between public figures in United States history

University of Virginia

- Founded the University of Virginia—an "academic village" in Charlottesville
- First university in the world that did not begin as a religious or theology school

Mounting debt

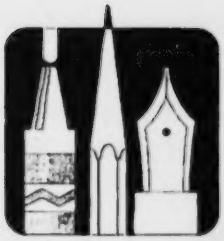
- 1815: Forced to sell his library—became the nucleus of the Library of Congress
- At the end of his life, owed over $100,000 and knew that Monticello would be lost to his descendents

"Is it the 4th?"

- July 4, 1826, was the 50th anniversary of the Declaration of Independence.
- Thomas Jefferson died on July 4th around 1:00 p.m. at Monticello.
- John Adams died in Massachusetts the same day around 5:00 p.m.—his last words were, "Jefferson still survives."

Indeed he does.

TWELVE



Discovery and Inquiry

DISCOVERY LEARNING

Although the phrase "discovery method" has been used to describe a variety of instructional techniques, most definitions include the learner's discovering what is to be learned without much assistance from the teacher. After discovering the rule that underlies the example, the student must apply that rule to a new example or concept. Because of its many uses, discovery learning is sometimes called the inductive method, guided discovery, problem solving, activity learning, or learner-centered instruction (Blake, 1984). Although these are used as synonyms for discovery learning, there does exist a difference between it and the inductive, guided-discovery, and problem-solving methods. The inductive method is a mental process, whereas discovery learning is an instructional strategy. In guided discovery, the teacher guides students by using hints, questions, and other devices. This differs from pure discovery in that students receive no help. Finally, problem solving requires students to discover or find many different rules they may have already known in isolation and craft them into a solution (Blake, 1984).

Discovery learning can be broken into the following two parts: (a) the amount of guidance and (b) the sequence of rules and examples. The variable regarding guidance is straightforward and deals with how much

assistance a teacher gives a student in the learning process. This can range from providing no help to providing many clues and hints. To understand the second variable in sequence, it is important to understand what a rule is and where it came from. In Bloom's domains and categories of learning behaviors, the three domains are psychomotor, affective, and cognitive. Discovery learning is located within the cognitive domain and primarily deals with the last three categories of learning behaviors—concept, rule, and problem solving. A concept is a class of objects, things, or events. A rule is the interaction of two or more concepts. Problem solving involves selecting, combining, and/or generating rules to solve a problem (Blake, 1984). Therefore, in discovery learning, the student is trying to discern the rule having to do with the interaction of the concepts in the example. The sequence of rules and examples in discovery learning is always example, then rule—referred to as "egrule." This contrasts with the sequence in the expository method. Here, the teacher supplies the student with all of the content to be learned, and the student applies that knowledge to an example. Expository learning results in a rule-to-example sequence—"ruleg" (Blake, 1984).

David Ausubel stated that the rationale for discovery learning was that all true knowledge is self-discovered (Blake, 1984). This echoes an earlier belief of John Dewey, whose rationale for discovery learning lay in the distinction between knowledge and the record of knowledge. To Dewey, knowledge was gained when students created or discovered that knowledge for themselves while being actively engaged (Davidson, 1971). Proponents claim that by experiencing the example first, abstract ideas become more concrete and easier to understand (Blake, 1984).

The lesson design for discovery learning is simple. First, students are presented with an example. This can be an interaction between any two or more concepts. The students study the example and attempt to discern a rule. During this process, the teacher plays a very limited role and does not provide content. Once the rule has been established, students are then asked to apply this rule to a new example or concept.

History and Research

The discovery method has been around for many centuries. Socrates engaged in a dialog of questions to the slave boy in an effort to help him discover the principle of geometry. In more modern times, discovery learning grew out of the progressive education movement. The method saw a large growth in interest during the post-Sputnik era when schools were encouraged to use discovery methods so students could become more "scientific" (Blake, 1984).

Although other proponents for discovery learning included Rousseau and Montessori, the two major designers of the method were John Dewey and Jerome Bruner (Blake, 1984). Dewey believed that education should be based on personal experience and that knowledge should be discovered. His book *Experience and Education* (1938) proved a major force in discovery

learning (Blake, 1984). Bruner's works in the 1960s helped to give discovery learning a boost in popularity (e.g., see Bruner, 1966). He has been credited with starting the experimentation necessary to establish discovery learning as a valid instructional method (Blake, 1984).

One of the loudest critics against discovery learning was Ausubel. His main contention had to do with whether discovery learning was more efficient in helping students learn given the large amount of time necessary for the method. He argued that if students could learn the material without discovery learning in less time, then discovery learning was inefficient (Hermann, 1969).

Research findings in discovery learning have often been contradictory. The primary reason is that researchers have been unable to agree on a single definition for discovery learning. Taking this into consideration, Hermann (1969) and Blake (1984) conducted two extensive meta-analyses of discovery learning research. Most of the research compared discovery learning with expository learning. Both researchers found that discovery learning assisted students in transferring the knowledge to a new problem. It was also more effective when the transfer task was more complex or when background knowledge was limited. They also found that discovery learning resulted in better long-term retention. In addition, research showed that discovery learning was appropriate for all subjects. It was more effective with low-ability groups than with high-ability groups. Finally, guided discovery was more effective than pure discovery.

Promises and Pitfalls

Discovery learning has several advantages. It is appropriate for all subjects and ages and uses students' own personal associations as a basis for understanding. It also allows students the opportunity to reconcile any misconceptions about a topic. Discovery learning has also proven easier for beginners in a field since understanding is constructed and not received. This learning method places the responsibility of learning on the learner (Svinicki, 1998).

A disadvantage of discovery learning is that it is time-consuming and does not lead to immediate retention. In addition, it is difficult for administrators to observe, and it demands teacher creativity.

Summary

The discovery learning model is designed to let the learners realize knowledge for themselves. Although there has been conflicting research, this method has been shown to be effective when the background knowledge is limited and the transfer task is difficult. It is more efficient than expository learning for overall task transfer. This method is a good way to begin a lesson and can serve as an advanced organizer.

NOTE: See the end of this chapter for a sample discovery learning lesson titled "How Do We Build the Tower?"

THE INQUIRY TRAINING MODEL

The inquiry training model (inquiry) is designed to teach students how to learn an inquiry process by asking questions and developing hypotheses concerning a puzzling problem, called a "discrepant event." Inquiry is a model of teaching in the information processing family. This model specializes in causal reasoning that helps students sharpen their scientific inquiry skills. Information processing models assist students to make sense of their world by acquiring and organizing data, identifying problems, and generating solutions. These models are designed to help students develop a conscious awareness of strategies for learning that will help them reflect on the world in which they live.

Inquiry builds on a child's natural curiosity. Students develop skills that are relevant and useful in helping them become autonomous learners. Using this method, students solve problems by asking a series of questions, collecting and verifying data, developing concepts, and building and testing hypotheses. With practice, students develop into independent, autonomous learners who become increasingly conscious of their process of inquiry. Students participate in the process of scientific inquiry, questioning why events happen, logically processing and analyzing new data, and in the process, developing intellectual strategies to use in the acquisition of knowledge. Although inquiry training is not in the social family of teaching models, students do collaborate with others to solve problems, and this collaboration helps them enrich their thinking and tolerate views other than their own.

There are five stages in the lesson design structure of inquiry training. In Phase 1, confrontation of the problem, the teacher explains the inquiry procedures and then presents a discrepant event. Teachers and students must use the language of the inquiry process. Students are told that they will be able to ask the teacher questions with a "yes" or "no" answer. If the questions require more than "yes" or "no," students will be asked to rephrase them. Because students may feel uncomfortable asking questions and developing theories on their own, the teacher will not evaluate student theories; teachers will encourage students to make precise statements and will ask students to support their theories with facts. Interaction among students will be allowed during the inquiry process. Once the inquiry procedures are explained, the teacher presents the discrepant event. A discrepant event is anything that is puzzling or unusual. Joyce, Weil, and Calhoun (2000) state that "the ultimate goal is to have the students experience the creation of new knowledge, the confrontation should be on discoverable ideas. . . . bending a metallic strip held over a flame begins the inquiry process" (p. 177). An example of a discrepant event is the following scenario: You are traveling across the Golden Gate Bridge in San Francisco, and you realize that there is nothing under the bridge. What is holding it up?

In Phase 2, data collection, verification takes place. This is the stage in which students begin asking questions such as "What holds the bridge

up?" The teacher answers the students' questions to verify the nature of the objects and conditions and to verify the occurrence of the problem situation. Phase 3, data gathering and experimentation, requires students to isolate relevant variables and begin to restate their questions in the form of a hypothesis that could explain the discrepant event. To continue the example, an explanation may be, "Is the bridge held by the steel cables that are anchored at both ends?" A fact sheet, used in Phase 4, organizing, formulation, and explaining, is useful in helping the students understand the explanation for the discrepant event.

Phase 5, analysis of the inquiry process, has the teacher questioning the students regarding the process of inquiry. The main purpose of inquiry training is not to help students acquire knowledge; instead, the purpose is to teach the process of inquiry. In this final stage, the teacher might ask these questions: What questions were most effective in leading you to a hypothesis? What questions were not effective? What have you learned about this process? What suggestions do you have that would make this inquiry more effective? Students continue to use inquiry methods to learn more about their world because new knowledge is continuously available. Both teachers and students are engaged in a never-ending quest for new information. The inquiry training model is one tool teachers and students need in their acquisition of knowledge.

History and Research

In 1962, Richard Suchman developed the method of teaching called inquiry training. Suchman defined inquiry as "learning that is directed and controlled by the learner." All students should be responsible for their own learning. Since he believed that "all knowledge is tentative," students need well-developed inquiry skills so they can become life-long learners. Students begin to understand that there is not always only one right answer. When questions are asked using new tools and technology, knowledge once considered a "truth" might turn out to be false or inaccurate. In the inquiry technique, students learn the art of asking questions and the science of searching for answers. The tools of inquiry include an inquiring mind, the ability to ask questions to collect more data, and the ability to analyze findings to determine possible reasons or discover solutions to a problem. Since students are naturally inquisitive, teachers should present information in such a way as to help students increase their power of inquiry. Most of Suchman's work dealt with children of high intelligence. Using inquiry training, highly verbal students more than doubled their ability to inquire effectively to solve problems, and they increased their use of analytical procedures when learning new information (Suchman, 1962). Suchman's research showed that inquiry training was very beneficial to gifted students, but other research studies showed that all students could benefit from inquiry training.

Another researcher, Howard Jones (1966), studied the effects of planned guidance on the problem-solving abilities of elementary-age stu-

dents. The results showed a significant relationship between inquiry training and changes in the problem-solving behaviors of elementary students, but there was no significant relationship between inquiry training and concept transfer or changes in recall of factual knowledge.

Ivany (1969) and Collins (1969) studied two modes of teaching science —the expositional and the hypothetical. The Illinois Inquiry Training Program developed by Dr. Suchman was implemented with their experimental treatment groups. Their study showed that inquiry training worked best when the discrepant event was strong and the topics under consideration were especially instructional. For example, in determining how a suspension bridge works, students' knowledge deepens if they can build a model of a suspension bridge. One of the instructor's responsibilities prior to the lesson is to select appropriate puzzling events for inquiry—discrepant events suitable for capturing the students' interests. The selection of the discrepant event is crucial for the success of the lesson.

Emily Elefant, a science teacher at a school for the deaf, conducted a study to determine the strategies that would be acquired by deaf students involved in an inquiry training program modeled on Suchman's design (Elefant, 1980). As in Suchman's study involving gifted students, behaviors exhibited by the deaf students were no different from those of the hearing students. The actual number of inquiry behaviors and experimenting behaviors increased over an eight-week period.

Studies by Schlenker (1986) showed that inquiry training increased the understanding of science, creative thinking, and skills for obtaining and analyzing information. Inquiry training proved as effective as recitation or lectures accompanied by laboratory experiences, but not more effective than any other information processing method.

Donald Hansler (1985) conducted a series of studies over a three-year period to determine whether inquiry was effective for teaching problem solving, thinking, and decision making. He concluded that inquiry training was a potentially highly effective method of teaching cognitive skills and was appropriate for use with elementary-level to college-level students. Although many educators feel inquiry methods of teaching are best in science courses, Hansler's studies showed that inquiry could be used with almost any subject. With some modifications and teacher training, inquiry can be one of several strategies in a teacher's repertoire.

Promises and Pitfalls

Implementing inquiry training as a teaching strategy has numerous advantages. Inquiry can be used successfully with elementary, secondary, and college-age students. It is adaptable to all elementary and secondary curriculum areas, although inquiry training seems most suitable for science curricula. Like the social family models of teaching, inquiry encourages cooperation, although it provides students with more intellectual freedom. Because the teacher does not evaluate students' questions and theories, students feel a greater sense of equality in the learning process.

Where inquiry training is a prevalent method of teaching, schools report an increased use of their school libraries.

Disadvantages of implementing inquiry training are important considerations. First, the method takes time—time to train students in the process and time to train teachers in the method. Inquiry is not one of the most familiar of the teaching methods, especially among teachers of nonscience curricula. Second, inquiry training involves risk taking on the part of students, who must develop the skills and courage to question and verbalize possible theories. It also involves risk taking on the part of the teacher, who must be willing and able to turn over the direction of the learning process to the students. Third, lower-level students may have difficulty generating questions. In addition, some students in all ability levels have difficulty working with and expressing theories. Since the major focus of inquiry is on students' developing inquiry skills, some teachers and administrators may have difficulty using a model that emphasizes the process over the acquisition of specific facts or concepts. However, if implemented correctly, inquiry training could do both—teach the inquiry process as well as the content.

Summary

All teachers need a selection of teaching tools from which to choose to meet the various needs of their students. Inquiry training is not a model of teaching with which many teachers feel comfortable, but that should not be a reason for not using it. Administrators should create a school environment in which teachers are willing to take risks and try new methods of teaching. Some teachers teach only the way they were taught or teach only the way they learn best, but not all their students learn best using these methods. Traditionally, teachers have felt responsible for directing instruction and learning, but current thought is that students should be accountable for their own learning, although this paradigm shift may be difficult for some educators and students to accept. All students in all curriculum areas need to possess inquiry skills. Since research shows that students of all abilities and ages can benefit from inquiry training, this method should be used in all classrooms. As our society enters the 21st century, more and more jobs require employees to be problem solvers and analytical thinkers. Schools have the responsibility to equip students with the skills they will need to be productive citizens. If all knowledge is tentative, as Suchman believed, citizens will have to be lifelong learners whether they want to be or not.

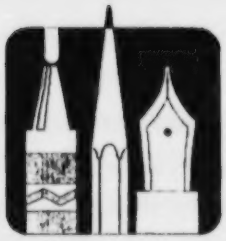
BUILDING THE TOWER: A SAMPLE DISCOVERY METHOD ACTIVITY

This activity is one that covers all the components inherent in the discovery method. It is learner centered and requires brainstorming and the formation and testing of hypotheses. The conclusion of the activity is a debriefing process that requires learners to evaluate their performance.

The materials needed for this activity are several packs of 100 4×6 index cards and a yardstick. The learners are grouped into teams and given an unopened pack of cards. They are told that they will have five minutes to build the highest-standing structure using only the index cards that they have been given. No "tools" of any sort are allowed; they can fold the cards, but that is all.

The first round of "play" is a five-minute planning stage. The learners cannot yet open the package of cards, but they can strategize and determine how best to build their structure. After the five-minute planning stage, the instructor gives the students a 10-minute experimental phase. The participants are able to open their cards and test the strategies they devised in the planning session. After 10 minutes of experimentation, the instructor takes up the used index cards and provides each team with a new unopened package. The students are then given five minutes to build the tallest structure they can. At the end of the building stage, the structures are measured and the winners are announced. Then the participants are given a 15-minute debriefing stage in which they determine what they could have done differently, what went well, and so forth. Finally, a reporter from each team takes a turn discussing the knowledge gained in the debriefing session.

THIRTEEN



Simulations and Role Play

SIMULATIONS

Simulations belong to the behavioral family of instructional strategies. They are constructed using real-life situations in a simulated environment. Simulations can be used to learn how to fly a plane, develop international negotiations skills, or resist peer pressures. Their applications for classroom use are numerous and are designed to enhance the cognitive and affective domains of learning.

Simulations are considered a form of experiential learning. Although they are sometimes called games or role play, a distinction needs to be made between role playing, games, and the simulations model. Games and role play are forms of simulations. Simulations can involve games, using rules and competition, but they do not use drama as is the case in role play. The learner is himself or herself, perhaps serving in another role, in a simulated environment but is still himself or herself. Any reaction from the simulated environment should be the learner's own natural behavior so that the consequences of actions can be learned while experiencing the simulation. Simulations are experiential learning, not direct instruction or rehearsed events. In simulations, mistakes are inevitable and desirable because the participants learn through these mistakes. In fact, sometimes the greater the disaster, the greater the learning (Jones, 1987).

Forms for the Simulation Model

There are several forms of the simulation instructional model. Simulations can use machines or people. For example, there are machine simulations for flight instruction, driver education, military combat, or simply trekking through the Oregon Trail. Most simulations are used to teach technical skills for learning to drive a car or to use machinery that can be both expensive and dangerous. Simulations teach technical skills in a safe, inexpensive way. Some simulations teach personal skills. Examples might be having students keep an imaginary bank account or play the stock market with fake money. Furthermore, some simulations have more of a gaming flavor, such as Monopoly or Trivial Pursuit. Today, several simulations can be used on the computer. Educators are split on the definitions and consider simulations, games, and role playing all to be the same or to have similar characteristics. Call them what you like, but use them. Students love them and they learn a great deal from them.

Machine simulations involve simulators or readily available software. The simulator is a type of training device that represents reality but that has controlled events. An example of this would be a driving simulator with which students learn to drive in a simulated automobile. The automobile simulator has the same mechanisms as an automobile—namely, a steering wheel, brakes, a clutch, and a gearshift. A moving picture represents the road, and realistic noises accompany the driving. This type of driving simulator mimics actual events that could occur while driving without the consequences in real life, thus enabling the student to acquire the skills needed later for actual driving. A flight simulator is another example; students can learn how to fly and master certain aspects before actually piloting a plane (Joyce, Weil, & Calhoun, 2000). Less complex machine simulations include computer games, such as the popular Where in the World or USA Is Carmen Sandiego, Oregon Trail, or SimCity software programs.

There are simulations involving both aspects of a game (roles and competition) with the components of a simulation. In gaming simulations, roles are defined for the players, a scenario is used to describe the situation, and a type of accounting system is used. The accounting system monitors and records the status of the players and provides appropriate feedback. In simulation games, success is defined in terms of player's goals with a prescribed criterion for winning (Dukes, 1978). These gaming simulations are usually competitive in nature, involving both the accumulation of points and clear winners and losers.

All-people simulations are another type of simulation. These simulations extract certain elements of a social or physical reality in such a way that students can interact with and become a part of a simulated reality (Dukes, 1978). True simulations represent a real-life situation, which duplicates selected parts of an environment along with its interrelationships. A common mistake is to believe simulations involve role playing. In simulations, students are not performing in a dramatic role. It is the environment

that is simulated. The students participate as themselves in a role and are given the key facts, not asked to invent them (Jones, 1980, 1987).

Reality can be manipulated in numerous ways. Simulations can be used to demonstrate how governments work, teach economic concepts, or gain career knowledge. Simulations can be structured to demonstrate the adverse effects of prejudices, socioeconomic power, or unethical decisions. Simulations can help students learn about competition or cooperation and empathy or apathy (Joyce et al., 2000).

Joyce et al. (2000) describes the following four components of the simulation instructional model: orientation, participant training, simulation operation, and debriefing. In the orientation phase, the teacher presents the topic and concepts to be explored and explains the type of simulation in which the students will participate. In the second phase, the rules and procedures are established. The third phase involves the actual simulation activity. The students participate, and the teacher serves as a referee or coach. The final stage is the participant debriefing, in which the events are summarized and analyzed by the teacher and students.

Simulations are based on social situations so that cooperative interaction can flourish. The overall success of the simulation depends on the cooperation and participation of members. While some simulations can be disconcerting to individuals because they have the potential to reveal negative characteristics, the overall social system should be nonthreatening and one of mutual cooperation.

Rationale for Appropriate Use

Simulations can be used in numerous contexts and to teach numerous process skills, especially in the affective domain. Simulations have the unique ability to help students achieve attitudinal objectives more effectively than any other instructional model. It is possible for students to observe emotions through the use of texts or other media; however, no other instructional design format is capable of permitting participants to actually experience them (Thiagarajan & Stolovitch, 1978).

Thiagarajan and Stolovitch (1978) recommend the use of simulation games as a way of introducing instructional content; they consider it especially applicable for the social studies curriculum. Students become interested in the variables influencing an individual's behavior, making them eager to learn the background or content of the simulation's real-life counterpart. A simulation may also be used as the cumulative activity to provide students an opportunity to try out the skills and knowledge they have acquired during the unit of study. Maximum effectiveness can be achieved through the participation in the same simulation prior to and preceding the unit of study.

Simulation games are effective ways to assess the student's ability to transfer content skills and knowledge in a realistic context. The teacher will need to observe students and use an evaluative rubric, which can be somewhat complex; however, simulations are valid and authentic assessments.

Thiagarajan and Stolovitch (1978) found that they can also be used for instructional improvement. Used as a preassessment tool, educators can determine which skills need to be emphasized or de-emphasized depending on the observation and analysis of the performance of students during the simulation. By identifying student's strengths and weakness, the instructional delivery can be tailored to meet individual needs.

Simulations have a practical value for the classroom and, used correctly, can help students achieve affective objectives as well as introduce and integrate authentic learning and assessments for meaningful long-term learning.

Lesson Design

Simulations can be structured into three basic areas for the lesson design: the *briefing*, the *action*, and the *debriefing*. These are the terms commonly used in all simulation models. The teacher can serve as the controller-facilitator or referee-coach and is responsible for moving the students through the three stages of the lesson.

The briefing should be used to provide an overview of the simulation. The rules, roles, procedures, scoring, goals, and levels of decisions should be discussed. Roles should be assigned, followed by a short practice session to check understanding. During the briefing stage, the teacher should be cautious about disclosing too much information. If answers are available in reading materials or documents for the students, more learning will occur if they are encouraged to investigate on their own. One of the functions of simulations is to provide students with the opportunity to find out the facts. The teacher-facilitator will also need to explain the rules sufficiently for the students to carry out the simulation, but it is not essential for students to have a total understanding of the simulation at the start. Rules can be revealed as needed, imitative of real life (Joyce et al., 2000). Should the simulation involve various stages, a briefing should be included with each consecutive stage.

The action stage involves the actual simulation. Students participate in the simulation, and the teacher functions as a coach. Occasionally, the simulation may need to be stopped to provide feedback or evaluate performances and clarify tasks. If a new stage or round is required, the teacher briefs the class prior to starting it.

One possible danger involves inappropriate behavior by the students. This may happen if the facilitator fails to clearly explain the rules of the simulation. In ordinary teaching, the instructor will step in and correct the behavior or mistakes. There are arguments suggesting that this makes the activity ineffective and an instructor-controlled exercise (Jones, 1980). Additional arguments state that students should have the opportunity to make mistakes, take the consequences, and learn (Joyce et al. 2000).

After the action, the debriefing stage occurs, during which the events are summarized and analyzed. During the debriefing, students explain their parts, their perceptions of the problem, and how they dealt with it.

Each participant contributes without any comments from the others. The teacher then leads an open discussion. The teacher should structure questions in advance to guide students to the expected outcomes. The simulation is compared with the real world and related to the curriculum content.

The debriefing is a crucial stage and one that should not be rushed through, especially if the simulation had a hidden agenda. Simulations dealing with prejudices, ethics, or power plays can sometimes stir up emotions, with the participants feeling exposed or humiliated. These individual insights may not be pleasant, requiring a supportive teacher to guide students through the process.

History and Research

Simulations can be traced back to ancient war times. Ancient China had a war game called Wei-Hai, and Chaturanga was a war game first played about 1,500 years ago in India. Chess, developed during the Middle Ages, simulates battles between nations with the game pieces representing competing forces with various degrees of strength and flexibility. In these games, which were played primarily for enjoyment until the 18th century, the game pieces were useful in the planning and predicting war outcomes. Following its defeat by Napoleon, Prussia pioneered the development and refinement of war gaming. Chess pieces were replaced by pieces representing actual infantry, artillery, and cavalry units. Teams of players replaced two single opposing players, and judges monitored the game activity (Heitzman, 1983; Maidment, 1973).

During the 20th century, the U.S. military refined the Prussian model, and the development of the computer led to technical improvements in national security efforts. During the 1950s, experimentation began with other social simulations. Economists and business theorists used quantitative models of simulations. Soon, political scientists, sociologists, and psychologists discovered the practical value of simulations. Crisis games were developed and created possible future international disasters in various parts of the world. This simulation provided foreign policymakers with a set of alternatives in the event of an actual crisis (Maidment, 1973).

Harold Guetzkow and his colleagues at Northwestern University created an international relations simulation during the late 1950s and the early 1960s. Guetzkow introduced simulations into the educational arena. This simulation was known as the 'Inter-Nation Simulation.' It re-created the main structural and dynamic features of an international system. His model was used to explain the operation of a system, and it advanced the theory of international relations. Student teams represent countries and act as decision makers. Information is provided to the teams about the nation's economic, consumer, and military bases. Then trading and the development of various agreements begin. Organizations can be established or trade agreements made. Nations can make war, with the outcome being determined by the military force of the group. The negotiation stage helps

students develop an understanding of the principles in international relations (Joyce et al. 2000; Maidment, 1973).

Simulations are designed using cybernetics, a branch of psychology. Cybernetic psychologists compare humans to machines and conceptualize the learner as a self-regulated feedback system. Cybernetic psychology operates on the principle of sense-oriented feedback that is intrinsic to the individual, in which the ability to feel the effect of one's decisions is the basis for self-corrective choices. According to this theory, human behavior has covert behaviors, such as thinking and feeling, and overt behaviors, or actions. Actions are created by the received feedback. When the choices are played back, the consequences can be felt. Simply put, simulations in cybernetic terms are designed to create an environment in which feedback is given that results in self-corrective behavior.

Numerous books and research articles recommend the use of simulations; however, there is no recent empirical research to substantiate the claims of the effectiveness of the simulation model for instruction. Several documents state that more research was needed; however, none is forthcoming. Jones (1988) offered this reasoning for the shortage of empirical data, claiming that the studies are confined to one simulation only, making it difficult to measure results. Furthermore, Jones contends that the articles are full of hypotheses and statistics from the tests but usually say little about what actually happened.

Boocock and Schild (1968) also identify several research issues that confound studies. A simulation evaluation requires the use of experimental and control groups, which Boocock and Schild find difficult to implement in school settings. Likewise, they cite a variance in the degree of teacher capability, claiming that researchers cannot be sure that sample teachers are using the same techniques or are presenting the materials in the same way. Boocock and Schild hypothesized that teacher bias or preference for one teaching method would also confound the results.

Boocock and Schild conducted a study on the use of simulation techniques in the fall of 1964, as simulations were being introduced in the schools. The purpose of the study was to test students' role empathy and feelings of efficacy after participation in the simulation. Pre- and posttests were used to compare responses and measure the effectiveness of simulation activities. The study involved the use of two games. *Life Career* introduced students to labor, school, and marriage decisions and the consequences of those decisions, and the *Legislative Game* allowed collective decisions to be reached on issues with which members of society have differing interests.

Boocock and Schild concluded that the career game provided role empathy, especially with the boys who took the feminine role or role of the high school dropout. The male students developed a sympathetic attitude toward those roles after their experiences. The image of political roles was not changed by the legislative game, although feelings of political efficacy were greater. The most convincing evidence supporting the use of simulations was produced by the career game, for which actual cognitive learn-

ing gains were measured. Boocock and Schild stated that although their study was far from conclusive, they believed the results showed promising effects for positive results of the simulation, based on the stated objectives for the learner.

Promises and Pitfalls

Simulations hold much promise as an instructional method because they incorporate both the cognitive and affective domains of learning. Simulations help students develop process-thinking skills. Simulations can enhance decision-making abilities, communication skills, the use of persuasion, or to influence resisting. Simulations can be used for learning in general or be designed to integrate ideas and information students already have. A simulation experience leads students to see the interconnectedness of political, social, interpersonal, cultural, economic, and historical factors. Simulations are especially useful to help students understand the idea of social systems.

Simulations can be designed to affect attitudes. Participants can gain empathy for real-life decision makers, learn that life is more complicated than ever imagined, or decide that they can do something important about affecting their own personal lives or the lives of others. Simulations provide participants with explicit and experiential ideas and with concepts and words to describe human behavior. They act as an information retrieval device to help bring dormant knowledge to consciousness.

Simulations affect the social setting in which learning takes place. The physical format alone produces a more relaxed natural exchange between teacher and students. During simulations, the control of the classroom goes from the teacher to the structure of the simulation, allowing for better student-teacher relations. Simulations are engaging, helping students to drop their usual interpersonal facades, which leads to a more open classroom atmosphere.

The use of simulations leads to personal growth (a) through the discovery of personal skills, abilities, fears, and weakness that weren't apparent before and (b) by providing opportunities to express affection, anger, and indifference without suffering permanent consequences.

Joyce et al. (2000) claim that simulations have several advantages. One is the practice of complex activities prior to the application in real life. Simulations have the ability to help students learn from self-generated feedback and, consequently, learn necessary corrective behaviors, another distinctive feature of this instructional strategy.

Dukes and Seidner (1978) describe how simulation activities reach cognitive and affective educational objectives. They contend that simulations can incorporate a body of factual knowledge in the structure and functioning of the game so that the knowledge can be transmitted to the student through participation in the simulation. Simulations can be designed for students to use higher-order thinking concepts, principles, and processes. According to Dukes and Seidner, many objectives in the affective

domain may be attained only through the use of simulations, causing changes in attitudes or empathy and efficacy.

Maidment and Bronstein (1973) state that simulations have three advantages over other teaching methodologies: (a) an increase in student motivation and interest brought about by (b) the creation a favorable learning environment by having the teacher behave in a nonauthoritative role and (c) the presentation of realistic and relevant learning experiences.

Although simulations are a promising instructional strategy, possible drawbacks should be considered. First, there is a lack of evidence to support the effectiveness of simulation activities in the classroom, especially for cognitive skill attainment. A careful study of the practicalities of this model may suggest that in this day of high-stakes testing and accountability, there is no time to use models that do not guarantee success. For this argument, an assertion can be made that numerous instructional standards require the use of process skills, which can be obtained through simulation activities. In addition there is a strong need for our schools to have a positive influence on students' character building and value systems—something that may be achieved only through participation in simulation activities.

Experts note other potential problems with this instructional strategy. First, simulations can be defective, producing a lack of validity or playability. According to Maidment and Bronstein (1973), there is little educational value in a simulation game that does not in some way accurately reflect events in the real world or that creates a false sense of reality. The lack of playability refers to the lack of clear directions or rules that are too complex or confusing, requiring the teacher to continuously interrupt the flow of the simulation.

Jones (1987; see also 1980) also cautions educators on the use of correct terminology for simulation activities, stating that the wrong wording can lead to wrong expectations, which in turn can lead to wrong student behavior. Words can often be interpreted in numerous ways based on prior knowledge. For example, telling students they are going to play a game and having the students expect fun and games may create disappointment because it wasn't their expectation, or students may decide to interject a little fun through inappropriate behavior. Jones also warns that saying the simulation is a role play can be interpreted as a need for students to play a role and so not behave as they naturally would. Simulations are simulated environments, not behaviors. To avoid confusion, it is helpful for educators or the simulator presenters to use appropriate terminology. Jones recommends the words *simulation, event, participant, behavior, action, issues,* and *ethics* and not the use of the words *game, drama, play, player, act, winning,* or *losing* to describe simulations.

No matter which terms are used, simulations provide active and engaged learning for students. The lesson at the end of this chapter should

validate this model as an effective instructional strategy for helping students attain learning objectives.

Summary

Simulations provide relevant learning opportunities for real-life situations. They have numerous applications for classroom use—all designed to enhance the cognitive and affective domains of learning—and should be a regular part of a master teacher's instructional strategies.

NOTE: See the end of this chapter for a sample lesson titled "The Gifted and Talented Simulation."

ROLE PLAY ■

Role play is a method of learning based on role theory. In this instructional method, students adopt assumed positions and interact in a simulated life situation. Role play takes on different meanings for different people. These range from highly controlled, guided conversations to improvised drama activities to highly complex simulated scenarios (Ladousse, 1987).

Role play has roots in both the personal and social dimensions of education. On a personal level, it helps students find personal meaning within their social worlds and resolve personal dilemmas. Socially, it allows students to work together to analyze social issues and develops democratic ways of coping with these situations (Joyce et al., 2000).

To really understand the instructional model of role play, one must understand the concept of *role*, one of the central theoretical underpinnings of the role-playing model. Students must understand roles and how they are played to truly understand themselves and others. It is the teachers' responsibility to teach students to recognize different roles and to think of their own and others' behaviors using the concept of roles.

The role of the teacher is critical to the success of the instructional model of role play. It is not the time for teachers to check papers or do remediation with students while students participate in role playing. First, teachers may need to provide initial props to support the role play. These props make the role play more realistic and will engage the students in the instructional model. Teachers should also challenge the children to use the skills they are learning in other curriculum areas to apply them during the role play to assist in the problem-solving process. Sometimes, it may be necessary for teachers to enter into the role play to encourage the students to think more deeply and play their roles more realistically. By intermittently assuming roles in the children's play, a teacher can assess the students' understanding of their roles and their ability to solve problems.

Finally, it is important for teachers to provide enough time for the children to interact with the materials and with one another. Teachers should not rush the children; they need time to build understanding (Jarrett, 1997).

The instructional value of role playing is that students learn to analyze their personal values and behaviors. They learn empathy and respect from participating in the nine steps involved in the Shaftels' (Shaftel & Shaftel, 1967) model of role-play (see Table 13.1 later in this chapter). In addition, students learn strategies for solving interpersonal and personal dilemmas they encounter. Role playing also has nuturant effects as students learn skills in negotiating and comfort in expressing their own opinions (p. 73).

A teacher may use role play for two basic reasons. First, it can be used to develop a social program that teaches children to problem-solve as they work through social issues students will experience as they develop into adults. Teachers may also use role play to counsel a group of students who are experiencing a human relations problem (Shaftel & Shaftel, 1967, p. 70). This instructional method can also be used to increase the efficiency of academic learning through the portrayal of current events or historical circumstances or through the use of the dramatization of plays or novels (Chesler & Fox, 1966).

History and Research

Many people have designed models for role play. Each model has its own series of steps for conducting a role play. Fannie and George Shaftel, Mark Chesler and Robert Fox, and Gillian Ladousse are just a few names associated with the instructional model of role-play.

Mark Chesler and Robert Fox (1966) argue that role playing in the classroom works best when there is an attempt to follow a definite sequence of steps. The steps allow for a logical ordering and development of the role-playing session. The first step is preparation and instruction. During this step, the problem is selected, a warm-up is conducted, and instructions and roles are given to the students. The second major step involves dramatic action and discussion. The actual role playing itself and the subsequent discussion and interpretation of the action are conducted during this step. Evaluation is the final step in Chesler and Fox's model. This is the time for the students and the teacher to review the successes and failures of the role-playing experience.

Fannie and George Shaftel's (1967) model of role play has nine steps that involve assigning students to be either role players or observers during the enactment. Each of the steps has a clear purpose that contributes to the richness and focus of the learning activity. The collection of steps ensures that a line of thinking is maintained throughout the role play, that roles are assigned and understood, and that the discussion is rich.

Gillian Ladousse's (1987) model of role play is structured around a lesson design for teachers to follow while using the instructional model. First, teachers decide the aim of their role play, which focuses the children's attention. An example may be to encourage students to interpret a scene in

different ways through the use of photographs. Once the teacher explains the aim to the students, he or she warms up the group with an activity that introduces the students to the aim for the day. For example, in a lesson on the three branches of the government, the teacher may do an activity about how we would make a new rule for the class. Following the warm-up, the teacher moves onto the procedure part of the lesson. At this point, the teacher explains the problem and passes out role cards that describe the roles students are to take during the role play. The students then participate in the role play using their role play cards to support them. The lesson ends with the teacher conducting a follow-up discussion to allow the students to debrief the role play.

In their book *Models of Teaching*, Bruce Joyce, Marsha Weil, and Emily Calhoun (2000) describe the role play model created by Fannie and George Shaftel. The Shaftels' model of role play includes nine steps (Table 13.1). To begin the role play, the teacher should warm up the students. To support the children in their understanding of the problem, the teacher should assist the children in expressing the problem vividly through the use of examples that the students generate based on reality, imagination, or literature. The Shaftels (1967) wrote *Role-Playing of Social Values: Decision Making in the Social Studies*, which presents problem stories that can be used by teachers to support Step 1 of the model. The problems the Shaftels present in their book are open-ended problems without solutions. It is the job of the students to use role play to generate solutions to the problem presented. Step 1 concludes with the teacher asking probing questions that will require the students to make predictions concerning the outcomes of the problem story.

Following the presentation of the problem, a brief discussion of examples that relate to the problem, and predictions about the outcome of the problem, the teacher moves on to Step 2. In this step, characters involved in the role play are clarified and students are assigned roles. The teacher can assign roles or students can volunteer for them. Once the roles are assigned, the next step involves the students and the teacher creating the setting to support the problem that has been presented. Next, in Step 4, the students who are not assigned roles in the role play are assigned as observers who are responsible for examining how students are playing their roles, the solutions that the role play demonstrates, and the feelings and emotions shown by the role players.

In Step 5, the role players conduct the role play in front of the observers. The role play should be short and allow for the role players to respond to each other. The purpose of this step is to ensure that the role players and observers really understand the problem they are dealing with. A discussion and evaluation of the role play that was just conducted make up Step 6. The observers discuss what they observed, how the role players solved the problem, and the consequences of the way the problem was solved during Step 5.

Following the discussion and evaluation of the first enactment of the role play, the students reenact it, which is Step 7. This time, the information

Table 13.1. Components of Role Play

Step 1	Warm up the group
Step 2	Select participants
Step 3	Set the stage
Step 4	Prepare the observers
Step 5	Enact
Step 6	Discuss and evaluate
Step 7	Reenact
Step 8	Discuss and evaluate
Step 9	Share experiences and generalize

that was discussed and evaluated in Step 6 is incorporated into this reenactment. Once again, a discussion and evaluation is conducted on the reenactment that just took place (Step 8). The role play ends with Step 9 as the teacher helps the students produce generalizations that can be made about the problem and the appropriate solutions to the problem presented by the teacher. The teacher may have to guide the students to the generalizations and how they can apply to their personal lives.

Promises and Pitfalls

Role play has many advantages over traditional ways of problem solving. First, the traditional approach to problem solving involves only having the children think about the possible solutions. Role playing requires the students to use cognitive and affective skills to generate solutions to problems. For children who are bored and find school a waste of time, role playing simulates the real conflicts of the child's world, which makes school more meaningful and relevant for them. Children who are engaged in role play are not involved in competition activities, so children feel more relaxed and friendly while they are learning. In traditional instruction, students learn concepts from listening to their teacher lecture

to them. In role play, students learn by doing. It converts ideas into direct experiences. One of the most important advantages of role play is that it makes students aware of the possibilities of alternative choices as they observe and participate in ways other than their own of resolving problems. Finally, role play allows students to examine their own values, defend them, and possibly make changes to their values as a result of looking at a problem from a variety of perspectives (Furness, 1976).

Role play does have disadvantages that administrators and teachers need to be aware of when using this instructional model. First, compared with traditional instructional models, the teacher turns over a lot of the responsibility of learning to the class and individual students. The teacher presents a problem, but the students generate solutions to the problems through the role play. The teacher can indirectly influence the solutions through the discussions that follow the first and second enactment, but he or she turns over most of the control of learning to the students. Role playing does take a lot of time. Students need time to fully explore the problems, problem-solve solutions, and enact their role play. If a teacher rushes this process, the purpose of the role play can be lost because insufficient time was provided. Many times, role play may be seen as too entertaining or frivolous. It looks different from the traditional classrooms where students sit in their seats and do their work without any noise. Finally, if the students have not had many experiences with problem solving, the solutions generated during the enactments may not be what the teacher wants the students to learn. Problem solving is a skill that needs to be worked on prior to engaging in role play so that students have prior knowledge of generating and supporting solutions to problems presented to them (Van Ments, 1999).

Summary

Role play leads students to understand social behavior, their role in social interactions, and ways of solving problems effectively. The model involves students acting out conflicts, learning to take the roles of others, and observing social behavior (Joyce et al., 2000).

Role play is best used when the teacher wants students to experience and become involved in the situation they are studying and to formulate their attitudes toward it. It is an excellent way for students to develop interpersonal and communication skills, and it provides highly motivating and memorable lessons.

In the following staff development activity for teachers, there are 10 applicants who have applied for the National Gifted Program in Washington, D.C. This is a free school that selects only three or four new students per year. The school is nongraded and defines *gifted* and *talented* loosely. Tell the teachers that the objective of the simulation is to devise their own selection criteria and procedure and then select the top three applicants. They must be able to defend their choices. Next, the teachers should rank order the applicants from 1 to 10, with 1 being the top selec-

tion and 10 being the last. They should then defend their positions for this ordering. Finally, share with the group what these selectees grew up to become (1. university professor in physics; 2. brilliant scientist; 3. famous wife of a president; 4. congressman; 5. satirist; 6. most famous president; 7. famous inventor; 8. famous dancer; 9. inventor; 10. famous congresswoman).

The following abbreviations are used in the exercise:

AQ = achievement quotient

IQ = intelligence quotient

SQ = social quotient

CQ = creative quotient

For the sake of the simulation, 100 is average for all four quotients. As a follow-up activity, have the teachers try to figure out who the individuals really were. Variations can be done with students on who would be the best scientist, the best artist, best farmer, and so on.

Gifted and Talented Simulation: A Sample Lesson Using Simulation

Applicant #1

FATHER	MOTHER
Name: Bill Grost	**Name:** Audrey Grost
Address: Lansing, Michigan	**Address:** Lansing, Michigan
Age: 30 **Race:** Caucasian	**Age:** 28 **Race:** Caucasian
Place of birth: East Lansing	**Place of birth:** East Lansing
Nationality: American	**Nationality:** American
Occupation: Accountant	**Occupation:** Housewife
Religious preference: Catholic	**Religious preference:** Catholic
Educational level: M.S.	**Educational level:** B.A.
Interests: Sports, reading	**Interests:** Sports, music

Applicant #1
Child applying for N.G.P

Name: Mike Grost **Age**: 10 **Educational level**: Grade 6
Height: 4'11" **Weight**: 75 lbs. **Appearance**: Average
IQ: 180 **SQ**: 140 **AQ**: 170 **CQ**: 165

School adjustment: Aloof from age peers, organizer
General physical health: Excellent
General emotional health: Excellent
Congenital abnormalities: Requires glasses
Evaluation of family stock: Above average
General political beliefs: Conservative but futuristic
Special interests: Chess, math
Special skills: Eidetic memory
Vocational goals: Make a commitment to education
Personal goals: Personal fulfillment and make significant contribution to society
Vocational contributions: Published an original mathematics theorem (Accepted by the American Association of Mathematics)

Applicant #2

FATHER	MOTHER
Name: Herman Edder	**Name:** Anna Edder
Address: Gary, Indiana	**Address:** Lansing, Michigan
Age: 31 **Race:** Caucasian	**Age:** 30 **Race:** Caucasian
Place of birth: Germany	**Place of birth:** Germany
Nationality: American	**Nationality:** American
Occupation: Self-employed	**Occupation:** Housewife
Religious preference: Agnostic	**Religious preference:** None
Educational level: High school	**Educational level:** High school
Interests: Reading	**Interests:** Music

Applicant #2
Child applying for N.G.P

Name: Sam Edder **Age**: 9 **Educational level**: Grade 4
Height: 5'1'' **Weight**: 74 lbs. **Appearance**: Homely
IQ: 82 **SQ**: 74 **AQ**: 82 **CQ**: 110

School adjustment: Very poor, considered unsociable, disturbed
General physical health: Often sickly
General emotional health: Certified emotional breakdown, removed from school temporarily
Congenital abnormalities: None
Evaluation of family stock: Average
General political beliefs: Quiet child, beliefs not known
Special interests: Frequently withdraws into fantasy world
Special skills: Plays violin, likes to be alone to read
Vocational goals: No evidence
Personal goals: Independence from family
Vocational contributions: None

Applicant #3

FATHER	MOTHER
Name: William Hall (deceased)	**Name:** Rosemarie Hall (deceased)
Address: Lives with grandmother	**Address:** Lives with grandmother
Age: — **Race:** Caucasian	**Age:** — **Race:** Caucasian
Place of birth: New York	**Place of birth:** New York
Nationality: American	**Nationality:** American
Occupation: Itinerant	**Occupation:** Chores
Religious preference: Presbyterian	**Religious preference:** Catholic
Educational level: B.A.	**Educational level:** High school
Interests: —	**Interests:** —

Applicant #3
Child applying for N.G.P

Name: Mary Hall **Age**: 10 **Educational level**: Grade 5
Height: 5'8" **Weight**: 76 lbs. **Appearance**: Unattractive
IQ: 110 **SQ**: 76 **AQ**: 83 **CQ**: 95

School adjustment: Erratic, withdrawn, seeks attention, fails often
General physical health: Sickly, bedridden, hospitalized often
General emotional health: Bites nails, phobias, attention-seeking behavior, dominates
Congenital abnormalities: Wears back brace from spinal defect
Evaluation of family stock: Average or better, father alcoholic
General political beliefs: Conservative
Special interests: Daydreams, prefers to be alone, wants to be center of attention
Special skills: Patience with children, elderly or infirm
Vocational goals: None
Personal goals: Altruistic, prefers to help elderly or poor
Vocational contributions: None

Applicant #4

FATHER	MOTHER
Name: James Horn	**Name:** Jane Horn
Address: Indianapolis	**Address:** Indianapolis
Age: 29 **Race:** Caucasian	**Age:** 29 **Race:** Caucasian
Place of birth: Philadelphia	**Place of birth:** Philadelphia
Nationality: American	**Nationality:** American
Occupation: Banker	**Occupation:** Housewife
Religious preference: Protestant	**Religious preference:** Protestant
Educational level: B.A.	**Educational level:** B. A.
Interests: Sports, chess	**Interests:** Swimming, reading

Applicant #4
Child applying for N.G.P

Name: William Horn **Age**: 10 **Educational level**: Grade 5
Height: 5'4" **Weight**: 125 lbs. **Appearance**: Attractive
IQ: 169 **SQ**: 155 **AQ**: 166 **CQ**: 128

School adjustment: Good, organizer, and leader
General physical health: Excellent
General emotional health: Excellent
Congenital abnormalities: None
Evaluation of family stock: Above average
General political beliefs: Conservative
Special interests: Basketball, math
Special skills: Leader, self-motivated
Vocational goals: To teach math
Personal goals: Wants to make a personal contribution to society
Vocational contributions: None

Applicant #5

FATHER	MOTHER
Name: Van Gunther	**Name:** Mary Gunther
Address: Oklahoma	**Address:** Oklahoma
Age: 51 **Race:** Am. Indian	**Age:** Deceased **Race:** Am. Indian
Place of birth: Oklahoma	**Place of birth:** Oklahoma
Nationality: American	**Nationality:** American
Occupation: Rancher	**Occupation:** Housewife
Religious preference: None	**Religious preference:** —
Educational level: High school	**Educational level:** High school
Interests: Ambitious	**Interests:** Religion/philosophy

Applicant #5
Child applying for N.G.P

Name: William Gunther **Age**: 11 **Educational level**: Grade 4 (3 times)
Height: 4'11" **Weight**: 135 lbs. **Appearance**: Unkempt
IQ: 110 **SQ:** 85 **AQ:** 82 **CQ:** 115

School adjustment: Dislikes school, does not mind, has caused extensive damage to school yard and building through carelessness
General physical health: Good
General emotional health: Shy and bashful, prankster
Congenital abnormalities: None
Evaluation of family stock: Healthy, low-middle class
General political beliefs: Inconsistent and critical
Special interests: Horse riding, roping
Special skills: Good sense of humor
Vocational goals: Perform in wild west show (parents want him to be a minister)
Personal goals: Wants to see world, perform for people
Vocational contributions: Participates in local rodeos

Applicant #6

FATHER	MOTHER
Name: Joseph Wright	**Name:** Mary Wright (deceased)
Address: Indiana	**Address:** Indiana
Age: 45 **Race:** Caucasian	**Age:** Deceased **Race:** Caucasian
Place of birth: Virginia	**Place of birth:** Virginia
Nationality: American	**Nationality:** American
Occupation: Rancher	**Occupation:** Housewife
Religious preference: Baptist	**Religious preference:** Baptist
Educational level: Uneducated	**Educational level:** Uneducated
Interests: Horses	**Interests:** Cooking, state fairs

Applicant #6
Child applying for N.G.P

Name: Albert Wright **Age**: 17 **Educational level**: High school dropout

Height: 6'4" **Weight**: 170 lbs. **Appearance**: Plain

IQ: Unavailable **SQ:** Unavailable **AQ:** Unavailable **CQ:** Unavailable

School adjustment: Good, well-liked, respected, attendance irregular
General physical health: Good, large for his age
General emotional health: Pleasant, easygoing, poor self-concept
Congenital abnormalities: Opthamuscular weakness (eye wanders)
Evaluation of family stock: Mother illegitimate, father involved in several lawsuits
General political beliefs: Very conservative
Special interests: Physical sports, wrestling, practical jokes
Special skills: Likes to argue, fairly well-read, good debater
Vocational goals: Interested in retailing
Personal goals: Wants to own his own business and have a good family
Vocational contributions: Manual labor, clerked in store, longshoreman, considered lazy by employers

Applicant #7

FATHER	MOTHER
Name: Sam Ridell	**Name:** Nancy Ridell
Address: Michigan	**Address:** Michigan
Age: 54 **Race:** Caucasian	**Age:** 49 **Race:** Caucasian
Place of birth: Nova Scotia	**Place of birth:** Ontario
Nationality: Canadian	**Nationality:** Canadian
Occupation: Unemployed	**Occupation:** Teacher
Religious preference: Baptist	**Religious preference:** Baptist
Educational level: None	**Educational level:** B.A.
Interests: None	**Interests:** Literature, crafts

Applicant #7
Child applying for N.G.P

Name: Bill Ridell **Age**: 11 **Educational level**: Withdrawn
Height: 4'5" **Weight**: 75 lbs. **Appearance**: Pleasant
IQ: 81 **SQ**: 79 **AQ**: 87 **CQ**: 110

School adjustment: Withdrawn from school after three months, considered backward by school officials
General physical health: Enrolled in school two years late due to scarlet fever, respiratory infections, going deaf
General emotional health: Stubborn, aloof, shows little emotion
Congenital abnormalities: Enlarged head at birth
Evaluation of family stock: Father lower class, mother intelligent
General political beliefs: Unconcerned
Special interests: Mechanics, likes to build things, flying, likes to play with fire (burned down father's barn)
Special skills: Manual dexterity, reads well, poor grammar
Vocational goals: Scientist or railroad mechanic
Personal goals: Works hard, wants to earn money
Vocational contributions: Sold magazines

Applicant #8

FATHER	MOTHER
Name: Bill Hawkins	**Name:** Valerie Hawkins
Address: Los Angeles	**Address:** Los Angeles
Age: 55 **Race:** Caucasian	**Age:** 51 **Race:** Caucasian
Place of birth: California	**Place of birth:** California
Nationality: American	**Nationality:** American
Occupation: Entrepreneur	**Occupation:** Teacher
Religious preference: Catholic	**Religious preference:** Catholic
Educational level: Not known	**Educational level:** B.A., music
Interests: Writing	**Interests:** Traveling, sewing

Applicant #8
Child applying for N.G.P

Name: Elaine Hawkins **Age**: 12 **Educational level**: Elementary
Height: 5'2" **Weight**: 99 lbs. **Appearance**: Attractive, mature
IQ: 108 **SQ:** 84 **AQ:** 94 **CQ:** 115

School adjustment: Dropped out at age 10, claimed to be 16 years old
General physical health: Very good
General emotional health: Talked back, stubborn, rebellious, behavior problem
Congenital abnormalities: None
Evaluation of family stock: Broken home, mother works, rarely home, migrants
General political beliefs: Radical, outspoken
Special interests: Reading, art
Special skills: Dancing
Vocational goals: To teach dance
Personal goals: Wants a career in dance
Vocational contributions: Likes to play at being a dance teacher with neighborhood children

Applicant #9

FATHER	MOTHER
Name: Samuel Krebbs	**Name:** Sally Ann Krebbs
Address: Indiana	**Address:** Indiana
Age: 34 **Race:** Caucasian	**Age:** 32 **Race:** Caucasian
Place of birth: Indiana	**Place of birth:** Indiana
Nationality: American	**Nationality:** American
Occupation: Farmer	**Occupation:** Housewife
Religious preference: Methodist	**Religious preference:** Methodist
Educational level: High school	**Educational level:** Jr. high
Interests: Playing the fiddle	**Interests:** Sewing, canning

Applicant #9
Child applying for N.G.P

Name: Lloyd Krebbs **Age**: 11 **Educational level**: Grade 5
Height: 4'11" **Weight**: 142 lbs. **Appearance**: Average
IQ: 108 **SQ:** 98 **AQ:** 112 **CQ:** 105

School adjustment: Good average performer
General physical health: Very good
General emotional health: Good
Congenital abnormalities: None
Evaluation of family stock: Conservative, rural family, active in church
General political beliefs: Mostly conservative
Special interests: Sports, fiddle
Special skills: Active in 4-H
Vocational goals: Farming
Personal goals: Get married and own good farmland
Vocational contributions: None

Applicant #10

FATHER

Name: Ben Jackson
Address: Texas
Age: 47 **Race:** Black
Place of birth: Texas
Nationality: American
Occupation: Minister
Religious preference: Baptist
Educational level: High school
Interests: Music

MOTHER

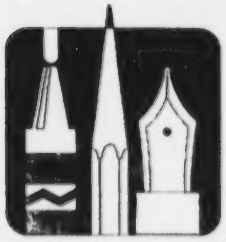
Name: Arlyne Jackson
Address: Texas
Age: 46 **Race:** Black
Place of birth: Texas
Nationality: American
Occupation: Housewife
Religious preference: Baptist
Educational level: High school
Interests: Wants daughter to be a music teacher

Applicant #10
Child applying for N.G.P

Name: Pearl Ruth Jackson **Age**: 16 **Educational level**: Grade 10
Height: 5'11" **Weight**: 195 lbs. **Appearance**: Heavy, unattractive
IQ: 138 **SQ:** 126 **AQ:** 149 **CQ:** 108

School adjustment: Top 5% of class, ghetto school
General physical health: Good, obese
General emotional health: Good, confident
Congenital abnormalities: None
Evaluation of family stock: Conservative parents, opposed to program
General political beliefs: Politically active in school
Special interests: Rock music, student government
Special skills: Debate team
Vocational goals: Wants to be a lawyer
Personal goals: Ambitious, hardworking, wants to participate in National Gifted and Talented Program
Vocational contributions: Has participated in local "get out and vote" efforts

FOURTEEN



Cooperative Learning

Cooperative learning has been attributed to gains in three major areas—academic achievement, intergroup relations, and social and affective development (Gillies & Ashman, 2000; Slavin, 1996). Academic achievement has been expressed in terms of higher grades, better retention of information, and more long-term learning; it benefits both high and low achievers, and it benefits all races and genders. The success of cooperative learning strategies is evident; moreover, it has been shown to cross all barriers of race, gender, and ability. It aids in the cognitive growth of all children at all levels.

The intergroup aspect of success is exhibited by better race relations in desegregated settings, more tolerance of different cultures, and an appreciation of diversity. Cultural diversity is an issue confronting all of society, and cooperative learning can assist in more positive interactions between the races in the future.

Students also display substantial affective development by showing higher self-esteem, an increased "liking" of school, better attendance, increased socialization skills, increased ability to work effectively with others, and a better understanding of people as individuals. It is important for schools to impart cognitive knowledge and skills to students, but it is also crucial for students to become contributing members of society. Cooperative learning can make these social processes second nature to

children, and they, in turn, can become better citizens making positive impacts on society.

The literature identifies essential components necessary for successful implementation of the cooperative learning model. Lyman and Foyle (1998) and Ngeow (1998) contend that seven elements contribute to the whole of cooperative learning:

1. Designed learning tasks based on shared learning goals
2. Groups consisting of two to six members
3. Prior teaching of effective group processes
4. Teacher initiation of concept
5. Cooperative learning behavior within the groups
6. Positive interdependence within groups
7. Individual accountability of all group members for the final outcomes

The teacher and student develop the intended learning task based on the shared goals of the school and the classroom. This allows students to take ownership in their learning through the establishment of the task. An essential aspect of cooperative learning is the structure of the group itself. A teacher must be aware of the situational aspect of group assignment and place students accordingly. The situational aspect refers to the role that each student has within a group. For example, different students within a group have different areas of academic strength. In most group situations, the teacher needs either to assign or approve individual, specific roles in cooperative learning settings for the purpose of balancing the group dynamic. The group task also contributes significantly to the composition of the group, and the potential group structures are innumerable—homogeneous, heterogeneous, mixed ability, equal ability, culturally diverse, and ranging in size from two to six members.

The teacher is responsible for the next two processes in the continuum of cooperative learning. Before group learning is to happen, the teacher must model and discuss certain group processes for students to be successful in the assignment. Communicating with others and being able to work well in groups are topics that must be explored and explained. The initiation of the cooperative learning task will occur when the teacher introduces the concept. This process provides students with some amount of prior knowledge or cognitive structure on which to base their group learning. Although the teacher is not directly involved in the cooperative learning, he or she initiates the concept discussion and establishes the framework on which the learning is built.

True cooperative learning can happen only when collaboration among all members of the group is required to accomplish a given task. This cooperative behavior and positive interdependence among the group members are crucial for successful learning. The promises of this method

are rooted in these two factors. Students are "forced" to cooperate and establish positive relationships as a means of reaching that predetermined end. Finally, individual accountability must be used to ensure that all students are learning and contributing. Within this strategy, it is too easy for a student to become passive and allow the other members to provide the learning, but teachers who encourage and mandate accountability for every student will find the most success with cooperative learning.

Cooperative learning has established its effectiveness across grade levels and curricular areas. Gillies and Ashman (2000) contend that "it has been used successfully to promote learning achievement in collaborative writing, problem solving in mathematics, comprehension in reading, and conceptual understanding in science" (p. 19). The affective domain has also shown positive growth, and Gillies and Ashman point out that "it promotes socialization and positive student interactions, improved attitudes to learning, and improved acceptance of children with disabilities by their nondisabled peers" (p. 20). These findings signify gains and growth in multiple cognitive and social domains.

Often, cooperative learning is viewed as solely an elementary strategy that works only with younger students. But this teaching model can promote growth in middle and high school students, who many times are attempting to establish independence from adult authority figures. Cooperative learning gives adolescents some degree of independence within their groups and creates a situation in which the progress of each member contributes to the group's success (Slavin, 1996). The adolescent is searching for an identity that conforms to the peer group, and cooperative learning can help the student with this quest.

Similar to other teaching models, cooperative learning has a "best" structure by which to organize the lesson. Stahl (1994) outlines five basic parts for a well-developed cooperative learning lesson:

1. A clear set of outcome objectives
2. A complete set of task completion instructions
3. Heterogeneous grouping
4. Individual accountability
5. Time for reflection and debriefing of the learning

Students must know beforehand exactly what they are expected to learn from the activity. This may be basic knowledge, social skills, or cognitive processes, but the teacher should dictate this information to students prior to initiation of the lesson. How are students supposed to accomplish the learning objectives? The teacher must provide concise and clear instructions for the activity so that students will be cognizant of the means with which to meet the end. This also has to be done before any group activity is started to avoid infinite questions after the activity begins.

The groups should be as heterogeneously mixed as possible. Academic ability, race, gender, ethnic backgrounds, and socioeconomic status are

characteristics to consider when grouping. Students will learn how to work effectively with different students and with classmates who probably are not "regular" friends. The diversity of the group exposes all students to viewpoints different from their own and provides the opportunity to appreciate the differences present in the human race.

The rationale for cooperative groups is to have the whole be greater than the sum of its parts. However, each member must be held personally accountable for the work completed and for internalization of the content. The teacher should develop appropriate devices to assess the learning and long-term retention of each student.

The last step is to allow time for reflection on the group process as a whole. This forces students to analyze not only the group dynamics used to achieve a goal but also how they individually contributed to the group's success. The stage is now set for improved cooperative learning in the future because students have reflected on the past "mistakes" and can use them as a springboard for continuous improvement.

HISTORY AND RESEARCH

John Dewey (1910) was the first to advocate the teaching methods combining academic inquiry and democratic learning. "Dewey viewed the school as a miniature democratic society in which students could learn and practice the skills and tools necessary for democratic living" (Ornstein & Hunkins, 1998, p. 46). Dewey also contended that one of the philosophies of education is not only to learn to acquire information but to bring that learning to bear on our everyday actions and behaviors (Ngeow, 1998).

More recently, renewed research efforts have been made to further develop cooperative learning models. Researchers and theorists who currently study the effects of cooperative learning are David and Roger Johnson, Robert Slavin, and Shlomo and Yael Sharan.

David and Roger Johnson, based at the University of Minnesota, have published numerous articles and books on the effectiveness of cooperative learning models. They contend that the education of cooperation is an important aspect of the entire schooling process. Their "learning together" (Johnson & Johnson, 1994) model, where groups hand in a single assignment and receive a group grade based on this product, has proven beneficial to student learning (Slavin, 1996). They have also searched for the effects of cooperative tasks and reward systems, the effect of peer teaching, and the improvement of intergroup relations and behavior (Johnson & Johnson, 1994).

Robert Slavin, codirector of the Center for Research on the Education of Students Placed At-Risk at Johns Hopkins University, has studied how cooperative learning can benefit children for which traditional teaching methods have been unsuccessful. The focus of his research is to find "best practices" for teachers to use to enhance student learning. Slavin has experimented with various types of grouping and differing group tasks.

His efforts have also focused on the implementation of heterogeneous groups and the importance of both intrinsic and extrinsic rewards for students.

At the University of Tel Aviv, Shlomo Sharan studies the impact of cooperative learning with regard to student achievement. His "group investigation" model (Sharan & Sharan, 1992) involves students in the planning, researching, and presentation of information to the class on a topic chosen by the group (Slavin, 1996). Students take ownership of the learning process because they are given the opportunity to chose interesting topics to study. Shlomo and Yael Sharan, along with Rachel Hertz-Lazarowitz, have intensely studied the outcomes derived from the group investigation model (Hertz-Lazarowitz, 1990; Sharan & Sharan, 1992).

PROMISES AND PITFALLS

Although the strengths or promises of cooperative learning are evident, educators are also identifying the negative consequences of using this method. Randall (1999) has contended that this model contains the following three challenges to learning:

1. The responsibility of members for each other's learning
2. The design of the cooperative learning group
3. A tendency toward lower-level fact-based activities

That students have responsibility for other members' learning may be too much for younger children who struggle themselves to learn. Also, if this arrangement is in place, students may work equally, or they may rely too much on their peers to provide conceptual understanding.

Frequently, the membership of the cooperative learning group includes one high achiever, one low achiever, and two average achievers. The result is that the high achiever becomes bored because he or she has to explain the information many times for the entire group to understand. Consequently, the lowest achiever can become a passive learner simply waiting for the other members to provide the needed information and learning.

In addition, the general nature of the cooperative learning activity is basic lower-level knowledge acquisition. Students need to develop and train their minds to be critical thinkers and problem solvers, and group work traditionally neglects this need. Simply stated, cooperative learning does not address the higher-level cognitive structures that students need to be a successful, contributing citizenry in the future.

The Case Method

It is important to note in this chapter on cooperative learning an offshoot of this instructional strategy—the case method. Case studies are a special form of the cooperative learning technique. In this instructional

method, students study individual cases representative of a type of institution, issue, problem situation, or the like in order to draw conclusions about the type as a whole (McBurney, 1995, p. 36). Examples of topics suitable for case studies include the following: the similarities of the causes of wars; the formation of clouds; the structure and function of the Krebs Cycle; the measurement of angles in a circle; effects of a recession on the economy; investigating the concept of the corruption of power; comparing Julius Caesar with Alexander the Great, Napoleon Bonaparte, George Patton, and Dwight Eisenhower; the mechanics of writing; the elements of literature; comparing synonyms with metaphors. Case studies allow students to focus on a situation or topic that is a prime example of its type. In this way, they learn specifics about individual cases and learn about the overall type as well. In addition, case studies offer opportunities to deal with specific diversity issues in the classroom such as prejudice, gender bias, poverty, and cultural misunderstandings. By acknowledging students' previous experiences and attitudes in response to multicultural and diversity issues, the teacher gains a clearer picture of strategies to use to introduce and integrate additional information and heighten cultural awareness. The case method also promotes and advances students' ethical and moral reasoning (Sudzina, 1993, p. 5). Meaningful learning occurs when a learner has a knowledge base that can be used with fluency to make sense of the world, solve problems, and make decisions. Higher-order thinking skills are important for all students; teaching them is not a frill, nor is it a skill that only *gifted children* can or need to develop (Lewis & Smith, 1993, p. 42). An important benefit of the case study method is its responsiveness to the varying developmental differences of students (Sudzina, 1993, p. 4). There are a variety of differences in today's classrooms. The case study method is responsive to all student reflections and opinions.

It is important for teachers, prior to assigning case studies, to discuss evaluation procedures with their students. Teachers should prepare students before lessons so that they will have a clear understanding of the teacher's expectations. If students are going to be tested on their grasp of the concepts discussed in a case study, they need to know. Ground rules are a necessity. Teachers may choose to let students set their own goals and work to meet them. Goal setting requires both creative and critical thought, as well as a sense of evaluation of what is important and what is not. Goal setting also requires time management and an organization of ways to assess whether the goals have been met at the end of the assignment (Parsons & Smith, 1993, p. 21).

After selecting a topic for study and materials, students can be divided into groups or pairs. Ground rules must be established. The teacher must clearly state the case, so students will not be confused during the lesson. If cases have been previously assigned, it is a good idea to briefly summarize the facts of the case for the benefit of those who may not have prepared. Teachers should emphasize the importance of reasoning during the assignment, rather than emphasizing the solution of the case study (McBurney,

1995, p. 37). Once students begin discussing the case, teachers should remain silent so that they don't give their conclusions or opinions. The teacher's role is to pose questions, draw out incomplete answers, and probe inconsistencies (McBurney, 1995, p. 37). So often, students will become anxious and sometimes dispirited when a teacher refuses to tell them the right answer. The case study method is designed to teach students that there is no one right answer, an important lesson unto itself.

SUMMARY

Cooperative learning is an instructional model adaptable to all grade and cognitive-ability levels. The effective teacher can propose the specific modifications needed in a particular classroom setting, and if this is duly accomplished, the lesson will extend knowledge and learning to students. An understanding of group processes is desperately needed for one to function effectively in society, and the more opportunities that students have to practice these processes, the more success they will experience in school and in life.

Cooperative learning has been proven to foster academic achievement, better intergroup relations, and social and affective development. These three areas give students an excellent knowledge and skills base that will help them develop into productive, contributing citizens ready to meet the future.

BUILDING THE PERFECT SCHOOL: A COOPERATIVE STAFF DEVELOPMENT ACTIVITY

Every educator at some point in his or her career has said or thought, "I could do things better. If only I ran this place, things would be done differently." This staff development idea allows teachers that opportunity, if only for a short while.

Divide teachers and staff members into groups and tell them that they are in a committee for the purpose of designing the perfect school. They need to determine roles and make sure that each committee member has an equal part. At the end of a set amount of time, they are to come to a mutual decision as to the perfect school. The key word is, of course, *mutual*. This activity allows teachers to see the cooperative method in action while they are actually involved in it. The relevancy of the activity to their real-life experience is obvious. It also puts them in their students' shoes for a change. Teachers can present their "perfect schools" upon completion, making sure to rationalize to the audience the choices they made during synthesis. This activity also gives teachers a chance to focus on and refine their educational philosophies. See Table 14.1 for a sample handout for participant consideration during this activity.

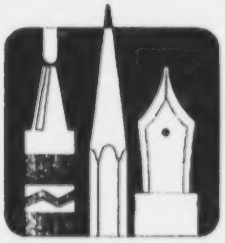
Table 14.1. Educational Philosophies

Educational Philosophy	*Method of Teaching*	*Exam*	*Preferred Architecture*	*Seating*	*Educational Outcome*
Perennialism	Lecture Discussions Seminars	Essay	Classical	Students grouped around teacher (philosopher)	Philosopher
Essentialism	Lecture Teaching Machines	Objective	Efficient Functional	Students grouped around teacher (scientist)	Technician Scientist
Progressivism	Discussion Projects	Gauge how well people can solve problem	Flexible Natural	Group	Good problem solver
Reconstructionism	Real-life projects Action projects	Gauge ability as activist	Nonschool setting "Schools without walls"	Outside involvement	Social activist
Existentialism	Learner is encouraged to discover the best method for himself or herself	Student should learn to examine himself or herself	Individual preference	Individual preference	Inner-directed person "Authentic individual" Committed, involved person

TABLE 14.1 Continued

Educational Philosophy	*Root Philosophy*	*Rationale*	*Curriculum*	*Teacher*
Perennialism	Idealism	Deals with that which is lasting —stresses intellectual attainment	Great books liberal arts	Philosophically oriented— knowledges about great ideas
Essentialism	Realism	Deals with basic knowledge— facts	3 R s, history, science, foreign language, English	Fact oriented Knowledgeable about scientific and technical data
Progressivism	Pragmatism	Search for things that work— experimental— democratic	Core, flexible Revolves around interests and needs, student-centered	Guide one who can present meaningful problems with skill
Reconstructionism	Pragmatism	Seeks to reconstruct society through education	Current events Social problems	Social activist Utopian oriented
Existentialism	Existentialism	Importance of the individual— "existence precedes essence"— paradox, subjectivity, anxiety	Individual preference	Committed individual I Thou—person who is both teacher and learner—one who provides a free environment

FIFTEEN



Synectics

Synectics is a teaching model for information processing that stimulates creative thought and problem solving through the use of metaphoric activity, attempting to break set ways of thinking to address familiar material in new ways or to introduce new material through previously learned concepts (Rettig & Canady, 2000). The word *synectics* is derived from the Greek *son*, meaning "to bring together," and *ectos* or *ectics*, meaning "diverse elements" (Weil, Joyce, & Kluwin, 1978). There are two main strategies or approaches in the synectics model. The first, making the familiar strange, seeks to assist students in looking at tasks or ideas in new ways. The second, making the strange familiar, is used to connect prior learning with new concepts. Synectics is rooted in metaphoric activity and seeks to increase students' capacity for creative thought.

Each strategy—making the familiar strange and making the strange familiar—attempts to help students connect prior knowledge with new concepts. Both strategies involve numerous steps that must be followed to elicit the desired metaphoric activity and conceptual distance needed to be creative. Both involve the three analogy types—direct analogy, personal analogy, and compressed conflict—although variations of each do exist.

Also called "creating something new," the first method, making the familiar strange helps students see familiar things in new ways, to view old problems or ideas in a more creative light. Possible objectives include

developing new understanding, empathizing, designing a new product, addressing social or interpersonal problems, and prewriting. Analogies are used to create conceptual distance, and steps are followed to ensure that students cycle through Gordon's stages of creativity, discussed later in this chapter.

HISTORY AND RESEARCH

William J. Gordon, known for his work in creativity, developed the synectics model, publishing *Synectics* in 1961 (Joyce, Weil, & Calhoun, 2000). The method was originally used for business and industry in "creativity groups." It was believed that by participating in creative exploration, new ideas could be formed and creative solutions for problems could be found. The model was later modified for the classroom. Synectics has deep roots in creativity, metaphoric activity, and Gordon's assumptions about the creative process.

Citing that creativity is important in everyday activities, Gordon proposes three assumptions about the creative process (Weil et al., 1978). First, the creative process is not mysterious; it can be described, and it is possible to train persons to increase their creativity. Gordon believes that teachers can directly train students to be aware of their own creative processes and that students can be taught to engage in metaphoric and creative activity on their own to assist in understanding topics and ideas. Next, creative invention is similar in all fields. Although most people associate creativity with artists, writers, and musicians, Gordon argues that we all possess the ability to be creative. Scientists call it invention; writers, inspiration; others, creativity. Finally, individual and group invention (creative thinking) are similar. The same processes that individuals go through to tap their creative potential are mimicked in creative group interaction.

A scholar in the psychology of creativity, Gordon adds additional holdings to his assumptions to further describe the creative process. He states that by bringing the creative process to consciousness and by developing explicit aids to creativity, we can directly increase the creative capacity of both individuals and groups. Gordon contends that in creative thought, the emotional component is more important than the intellectual, the irrational more important than the rational. He does explain that the rational mind should be used to evaluate alternatives and make decisions but that the creative process affords the individual or group a wider range of solutions. Gordon also argues that emotional and irrational elements must be understood in order to increase the probability of success in a problem-solving situation. From these holdings and assumptions, Gordon introduced metaphoric activity as paramount in the synectics model.

Metaphors establish a relationship of likeness, the comparison of one object or idea with another object or idea by using one in place of the other. By engaging in such activity, participants are able to make connections between prior knowledge and new concepts. Metaphor introduces "con-

ceptual distance" between the student and the object or concept and prompts original thought. This distance is presumed to increase the mental flexibility of participants. Just as the two strategies in synectics imply, metaphoric activity can make the familiar strange and make the strange familiar, offering participants a new view of an old topic or a way of relating new information to prior learning.

There are three basic types of metaphoric activity: direct analogy, personal analogy, and compressed conflict. A direct analogy is a single comparison of two objects or concepts (Joyce et al., 2000). The comparison need not be identical in all respects, and students would be expected to identify similarities and differences between concepts to strengthen the analogy. Direct analogies function to transpose the conditions of the real topic or situation to another topic or situation to afford new perspectives. Differing levels of strain are involved in analogical activity. Comparing oneself to a dog is a lesser degree of strain than comparing oneself to a car engine or other inanimate object. Participants involved in direct analogy are said to progress through stages of creative activity. Detachment from the situation, deferment of easy or obvious holdings, speculation about different approaches and framing, and finally, a return to the original situation make up these stages.

Personal analogy requires students to become involved empathetically with the ideas or objects compared (Weil et al., 1978). There are four levels of empathetic involvement: (a) first-person description of facts, (b) first-person identification with emotion, (c) empathetic identification with a living thing, and (d) empathetic identification with a nonliving object. The greater the conceptual distance attained through each type of analogy, the more likely that students have been creative or innovative in their thinking and in their work. Synectic success depends on the quality of analogies developed and mental stretching that students achieve.

"Compressed conflict" is generally a two-word description of an object in which the words seem to be opposites or contradict each other, sometimes called an *oxymoron* (e.g., "jumbo shrimp"). Gordon maintains that these contradictory terms provide the broadest insight into a new subject (Weil et al., 1978). Compressed conflict incorporates two frames of reference in viewing a single object and encourages the distance desired in the detachment and speculative stages. The greater the conceptual distance achieved, the greater the mental flexibility.

There is a paucity of research on synectics, aside from the studies commonly mentioned by instructional methods texts. In one study of college students, synectics was found to enhance both immediate and long-term learning (Joyce et al., 2000). Another study makes similar findings about learning and adds that although synectics is effective across domain boundaries, specific training in some domains increases the likelihood that students will master concepts. A study done in science revealed that the use of synectics with text materials bolsters short- and long-term learning (Glynn, 1994).

Gordon's Stages of Creativity

In Gordon's model, creativity includes seven stages, or phases. Phase 1 is the description of a present condition. The teacher has students describe a situation as they see it now. Students should be encouraged to flesh out the concept or topic and note specifics that can be used for comparison later in the lesson. Phase 2 is direct analogy, and the teacher prompts students to suggest direct analogies, select one, and explore and describe it further. Phase 3 involves personal analogy during which students are to "become" the analogy they selected in Phase 2. Empathetic involvement and a focus on the other three types of personal analogy is important because students must move through more pronounced levels of strain to flex their creative muscles. Phase 4 is compressed conflict. Students take their descriptions from Phases 2 and 3, suggest several compressed conflicts, and choose one on which to focus, preferably a grouping that reflects the truest ring of conflict. Phase 5 is direct analogy; in this phase, students generate and select another direct analogy, based on the compressed conflict and explore it in detail. The students then come to Phase 6, which is the reexamination of the original task. Finally, students move back to original task or problem and use the last analogy or the entire synectics experience to create new products or solutions. Students should exhibit more creative artifacts or solutions as a result of the model. Differences in perceptions, writings, and thinking should be noticeably different than at the beginning of the lesson.

Alternatively, aimed at increasing understanding and internalization of new or difficult material, the strange-to-familiar strategy makes use of similar phases but involves a different end. Metaphoric activity is used for analyzing, not for creating "conceptual distance," and while the first method involves a great deal of divergent thinking, this second method encourages students to converge thinking in creative ways (Lasley & Matczynski, 1997). Making the strange familiar involves defining or citing both the characteristics that are present and those that are lacking in analogies and comparisons. Through these comparisons, students gain a better understanding of new concepts because they have prior knowledge to build on, even though it may be seemingly unrelated in the beginning.

Phase 1 of making the strange familiar involves the provision of substantive input about the new topic by the teacher. Phase 2 is the direct analogy step; the teacher suggests a direct analogy and asks students to describe the analogy in as much detail as possible, in hopes of achieving some conceptual distance in the process. Phase 3 moves the students into a personal analogy, one in which the teacher has students "become" the direct analogy in the previous step. Phase 4 involves a comparison of analogies. Students identify and explain the points of similarity between the new material and the direct analogy. Phase 5 is concerned with explaining differences. To contrast the two frames of reference, students explain where the analogy does not fit. In Phase 6, exploration, students reexplore the original topic on its own terms, applying what they have

learned from the experience. Finally, Phase 7, generating an analogy, requires students to provide their own analogy and explore the similarities and differences found in the new pairing. Students should exhibit the ability to make connections and point out discrepancies in creative ways. The goal of this strategy is to make the strange familiar, and students should be able to evidence a more comprehensive understanding of the new material or concept.

Teachers have much to consider when tackling a synectics lesson. First they must master the process and operational procedures of each method. They must also take care to avoid premature analyses and limited mental stretching (Queen & Isenhour, 1998b). Teachers should explain the vocabulary to students and give them an idea of the purpose of each phase, as well as taking students through the process numerous times to build familiarity with the model. Teachers employing this method should strive to be well versed in evocative questioning and ready in advance to facilitate lesson flow and encourage spontaneity. Because of the "playful" nature of the activities, teachers must be proficient in time and behavior management. They must be sure to involve all students and accept all responses, and they should be prepared for nontraditional student and teacher interaction and dialogue. Done correctly, this model is fun and immediately productive. Results are obvious, and teachers can begin to ascertain the increase in student creativity fairly quickly. Done poorly, the model is a nightmare and will likely prove counterproductive.

In evaluating a synectics lesson, administrators or evaluators must understand the difficulty inherent in mastering all the steps and in stretching students to think divergently. The evaluator should be aware of what to look for in lesson presentations. Administrators should provide ongoing staff development in synectics and should be aware that the methods take time to master. Synectics is not direct instruction and may appear to be fluff during valuable instructional time. Evaluators not privy to the model and its form are likely to dismiss creative learning as "silly banter." This method requires strong classroom management skills. Evaluators observing teachers consistently using this model should develop an approach to instructional evaluation for this method and perhaps obtain forms or guide sheets to assist them.

Synectics does not require that a canned curriculum be purchased or that teachers bring in tons of equipment and materials. The two main resources necessary for success in the model are time and operational skill, both of which are necessary to realize all the benefits of the model. This method also requires an open and inviting classroom climate in which all students feel comfortable in contributing. Most of the time, needed materials will already be present. Although synectics is possible with large groups, smaller groups are recommended, and the classroom and teacher must support this type of grouping.

Peer teaching and observation is widely recommended in synectics literature as a way to train staff and help teachers master the method. The model is difficult, and care must be taken to offer thorough and continuing

staff development. Synectics materials and training groups are available as resources for schools or groups interested in learning the model. Training for synectics should include focus on the questioning and classroom management skills necessary for successful implementation, as well as training in the theory and processes undergirding the model. Short, brief introductions to this model may cause frustration and attrition.

PROMISES AND PITFALLS

There are many purported promises in the synectics method. Proponents argue that synectics stimulates and promotes creativity, encourages divergent thinking, addresses higher-order thinking skills, and bolsters students' ability to problem solve (Dallman-Jones, 1994). Synectics can be used in any subject or content area or for any activity, and the strategies work with all student types—high or low achievers, withdrawn or outgoing personalities, and students with varied learning styles. Synectics combines easily with other models and affords both instructional and nurturant effects. Users of the model claim that it promotes empathy and interpersonal closeness because all students are allowed to participate without fear of delivering an "absurd answer" and students gain deeper understanding of classmates and their views. Synectics requires students to synthesize and analyze, and the strategies can be used to introduce new concepts or to expand or review previously learned material. Synectics is alleged to bolster self-esteem because there is no "right" answer, and the model can be used individually or in groups. Finally, synectics improves self-expression—in oration, writing, and other areas.

Synectics has its drawbacks as well, and many teachers find themselves unhappy with the number of steps and the "weird" nature of the students and their interactions with metaphor and analogy. The methods, with their phases and steps, take some time to master and much preparation to implement. Younger children may have trouble with emotional expression or understanding the process and will probably have difficulty understanding the terms and activities involved. All levels of students may find the steps cumbersome and the operational vocabulary intimidating (Dallman-Jones, 1994). Students partial to left-brain, concrete, sequential thinking may be stretched out of their comfort zone in synectics, and teachers may be uncomfortable with letting student thinking "run free" or the fact that there is no "right answer."

SUMMARY

Synectics is not for the faint of heart. It involves a great deal of time and energy both in mastering the method and in instruction. Synectics is effective if it is implemented correctly and is useful in almost any setting, for any content, and at any point in the teaching of a unit. Synectics activities

often transfer to students who pick up the processes and begin to use them on their own, ultimately producing students who can use the approach as a system to create or remember any time they want. At the very least, synectics offers a viable alternative for instruction and addresses many of the skills and processes that educators want to deliver to students. Whether making the familiar strange or making the strange familiar, synectics stimulates creative thought and helps students make connections that may not normally go together well. Synectics, although involved and difficult to master, promises to continue to be an effective instructional method and alternative.

Following is a sample synectics lesson. Remember that the foundation of the synectics method includes developing various types of analogies—direct, personal, and new. This metaphoric activity is the central concept of this instructional method. *To Kill a Mockingbird* is especially appropriate because even its title is metaphoric.

After reading the book, students view the movie starring Gregory Peck. The presentation is used to help the students determine the direct analogy in a general way. First, students should consider the following question, "Who would be like the mockingbird?" Then the lesson moves to the second, personal, phase in which students empathize with the character by "becoming" him or her. Finally, the students can compress their own feelings into a new analogy in order to better understand the concept.

To Kill A Mockingbird
By Harper Lee

Harper Lee

- Born in 1926 in Monroeville, Alabama
- *To Kill a Mockingbird* was her first and only novel
- Was awarded the Pulitzer Prize in 1961
- Now lives a very private life in Alabama and avoids press interviews

Characters

Atticus Finch

- Lawyer in Maycomb, Alabama, in the 1930s
- Widower and father of two children, Scout and Jem
- Defends Tom Robinson, a black man who is accused of raping a poor white woman

Jean Louise "Scout" Finch

- Narrator of the novel
- An intelligent six-year-old tomboy
- Younger sister of Jem and daughter of Atticus

Jem Finch and Dill Harris

- Jem is Scout's ten-year-old brother who is fascinated with "Boo" Radley, their neighbor
- Dill is a "goin' on seven" friend of Jem and Scout who visits during the summer

Characters

Arthur "Boo" Radley

- A mysterious and reclusive neighbor of the Finches
- The children are terrified of him because of untrue rumors, but they try to get him to come out of his house

Tom Robinson

- A black farmhand who is wrongly accused of raping a poor white woman
- Defended in court by Atticus Finch
- His only "crime" was saying that he felt sorry for a white woman

Bob Ewell

- The main "villain" in the novel and known as the "trash" of Maycomb
- Charges Tom Robinson with raping his daughter, Mayella
- Threatened to get even with Atticus after the trial

Major Themes in
To Kill a Mockingbird

Racial Injustice

- A man's guilt or innocence was determined by his skin color
- Atticus demonstrates moral courage by defending Tom Robinson

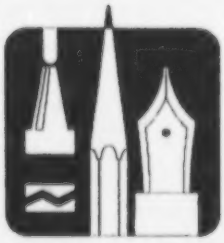
To Kill a Mockingbird

- "Mockingbirds don't do one thing but make music for us to enjoy. They don't eat up people's gardens, don't nest in corncribs, they don't do one thing but sing their hearts out for us. That's why it's a sin to kill a mockingbird."
- Tom Robinson and "Boo" Radley were "mockingbirds"—they didn't harm anyone but were victims of injustice and cruelty.

***To Kill a Mockingbird*:**
The Movie

- The movie was filmed in 1962 in black and white.
- Gregory Peck won an Oscar for Best Actor for his portrayal of Atticus Finch.
- Robert Duvall, who played "Boo" Radley, made his film debut in this movie.
- Harper Lee was pleased with the movie and the portrayal of its characters.

SIXTEEN



Socratic Seminar

In 1982, Mortimer Adler introduced *The Paideia Proposal*, using a group discussion model that can be easily incorporated into a blocked class. Each member of the class reads a selection from the material provided by the teacher prior to the seminar. The teacher avoids directing the discussion of the seminar. The teacher's role is to record the participation and degree of preparedness of each participating student. Students are instructed to explore their ideas about a particular topic and question other members of the class in an open discussion. Students thrive in these seminars once they discover that their opinion is valued and that the teacher is not searching for a specific, "right answer." The teacher usually asks the first question, or it can be elicited from a student experienced with the seminar format. Teachers avoid evaluation, direct the discussion toward topic relevancy, and clarify arguments if there seems to be no solution. The Socratic seminars often lead to further issues, thus extending the learning opportunities beyond one classroom discussion.

GROUP DISCUSSION AND STUDENT PARTICIPATION

The success of the Socratic seminar can be attributed to the stark contrast it provides to the normal classroom setting. Students are used to teachers being in front of them, perhaps at a podium, whereas the teacher is literally on the same level as the students in the Socratic method. Students are also typically seated in rows but are placed in a circle during a Socratic

seminar. Rather than teachers talking for the majority of the class time, students talk approximately 95% of the time during this instructional method.

In a comparison of a typical class discussion and the Socratic seminar method, student responses increase from 2 to 3 seconds in a typical discussion to 8 to 12 seconds in a Socratic seminar. Teachers are not to provide feedback during the seminar to ensure maximum student discussion time. This "silence" tactic works well in getting even those students who do not typically speak up to contribute. It also encourages students to think their way through their own ideas and speak up without concern about being incorrect; open exploration of thoughts is paramount.

Following is a list of the nine steps involved in the Socratic seminar.

- *Step 1:* Students arrive and form a circle prepared for the assignment
- *Step 2* The teacher presents opening question
- *Step 3:* Students respond to each other (Phase 1, about 15 minutes)
- *Step 4:* The teacher probes or clarifies *only*
- *Step 5:* The teacher asks core questions
- *Step 6:* Students respond to each other (Phase 2, about 30 minutes)
- *Step 7:* The teacher presents closing question
- *Step 8:* Students personalize discussion (Phase 3, about 30 minutes)
- *Step 9:* Seminar evaluation (Phase 4, usually 15 minutes)

■ WHAT HAPPENED? A SOCRATIC SEMINAR

This activity is one that may begin simply and in an unassuming way, but as so often happens in the Socratic seminar method, the relevance becomes serious and encourages deep introspection.

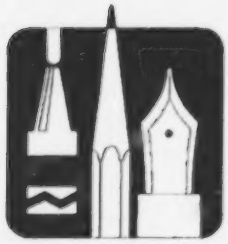
In preparation for this activity, the book *The True Story of the 3 Little Pigs* by A. Wolfe (Scieszka, 1999) should be read aloud. This book, available in any library or bookstore, is a twist on the traditional fairy tale in that it is told from the point of view of the wolf, who believes himself to be innocent of the crimes of which he has been accused.

To begin the seminar, the opening question is presented: Should the wolf be charged for the crimes? After approximately 15 minutes, in which the students have control and the instructor merely clarifies or probes only when absolutely necessary, a core question is asked, such as, "What should the punishment be?" or "Do you believe in capital punishment?" In the next phase, the teacher asks a closing question, such as, "Should Osama bin Laden be executed?" It is important to personalize the closing question in some way, such as having the students pretend, if necessary, that they lost a loved one in the terrorist attacks on the World Trade Center and the Pentagon on September 11, 2001 (using the bin Laden example from before).

Most teachers have thought that the Socratic seminar could be used for limited areas in English and perhaps the arts. As a teacher, I have found that the Socratic seminar can be used in any subject. It is great for

the social sciences and even the sciences. I know of teachers who even do specific problems in advanced mathematics. Feel free to modify the time periods, and in some cases, math for example, only the first and third questions can be used, omitting the second question. One thing is important: Experiment—and then experiment some more. What works for one teacher will not always work for another.

SEVENTEEN



Instructional Assessment

Instructional evaluation, or assessment, was once exclusively the teacher's domain. It consisted mainly of predetermined paper-and-pencil testing. Periodically, the students read a book, wrote a report, or gave an oral presentation, activities that all had to live up to the expectations of the individual teacher. Now assessment is not necessarily based on the sole, personal judgment of the teacher. Students are included. As the community demands more student accountability, students are becoming more involved in their own learning process, including evaluation and assessment.

Instructional evaluation occurs through the assessment of student achievement, which often depends on the effectiveness of the instructor. For example, does the teacher choose the right delivery system? Are the teacher's objectives clear? Do test items relate to objectives? Evaluation of instruction is also evaluation of the curriculum. It reveals the success of one dimension—how much the student achieves in areas that are assessed. It may also indicate whether the content has been adequately covered. Evaluation of instruction does not answer curricular concerns as to whether the subject matter was the right choice, whether its content is relevant, whether it meets student or societal needs, and whether it has been selected wisely.

METHODS OF INSTRUCTIONAL EVALUATION

Measurement is the means of determining the degrees of achievement of a particular competency. Testing is the use of instruments for measuring achievement. The three phases of instructional evaluation are (a) preassessment, evaluation that takes place before instruction; (b) formative evaluation, evaluation that takes place during the instruction process; and (c) summative evaluation, assessment that takes place at the end of instruction.

Preassessment

The tool used in preassessment is the criterion-referenced test or pretest. The criterion-referenced test measures the entry skills that have been identified as critical to beginning instruction. This is also known as a pretest. The pretest is criterion-referenced to the objectives the designer intends to teach. A pretest by itself is not sufficient to address all needs at the beginning of instruction. If students perform poorly on a pretest, the instructor may not be able to gauge whether they did poorly for lack of general knowledge or for lack of the knowledge required for entry-level instruction.

A second type of test is designed to help students measure their skills against the skills of others. These types of tests are called norm-referenced tests. Norm-referenced measurement compares a student's performance on a test with the performance of other students who took the test. Norm-referenced testing is necessary when a limited number of spaces are to be filled from a pool of applicants. Norm-referenced measurement permits comparisons between people, with the primary purpose of making decisions about the qualifications of individuals.

Formative Evaluation

Formative evaluation consists of formal and informal techniques of assessing the learning of students. Formative evaluation occurs during the process of instruction. It may include questions at different points during the instruction or checking students' responses to parts of the instruction. Instructors use formative evaluation to determine if the skills to be learned are being addressed. It allows instructors to determine whether they need to provide remedial instruction to overcome difficulties.

Summative Evaluation

Summative evaluation is the assessment that occurs at the end of a course or unit. The tools used are final exams, a posttest, or an actual demonstration of a skill or operation. It is used to determine whether students have mastered the instruction.

ASSESSMENT OF STUDENT ACHIEVEMENT

Several new ways are available to evaluate student achievement. The new tools are called performance-based or authentic assessment. *Authentic* means "worthy of acceptance or belief, trustworthy" (Engel, 1994, p. 24). Assessments are authentic because they are valuable activities within themselves and involve the performance of tasks directly related to real-world problems.

Portfolios, authentic assessment measures, and *alternative assessment activities* are the latest buzzwords used to describe activities other than standardized tools for determining a student's achievement. Educators, parents, and students have come to realize that standardized tests do not truly represent a student's academic growth in the content knowledge, skills, and instructional activities in the classroom. Following is a more detailed explanation of these methods of assessment, beginning with a definition of *assessment*.

- An *assessment* is an exercise such as a written test, portfolio, or experiment that seeks to measure a student's knowledge in a subject area.
- A *portfolio* is a systematic and organized collection of a student's work throughout a course or school year that measures the student's knowledge and skills and often includes some form of self-reflection by the student.
- *Alternative assessment* is any form of measuring what a student knows and is able to do other than traditional standardized tests, including portfolios, performance-based assessments, and other means of testing students. These alternative assessments show actual growth over a period of time that the students, parents, and teachers can physically see. Tests do not show this growth as it occurs.
- *Authentic assessment* allows the student to "become progressively self-disciplined as a thinker . . . (and) to acquire the habit of inquiring and engaging in discourse with care and thoroughness" (Wiggins, 1993, p. 211). Its purpose is to get students to take control of their own learning while maintaining relevance and a meaningful connection to what they are learning. Student contracts, for example, enable students to take responsibility for their own learning while giving them freedom to explore; these contracts also teach organizational control of the lesson content.

Portfolio

The portfolio, a collection of student writing samples assembled over a period of a course or longer, is the most popular form of alternative assessment and is authentic assessment when done correctly. It is like a collection of photographs of a student's writing. Analyzing each writing sample singularly does not give one a complete picture. The portfolio allows for a

comprehensive evaluation of a student's growth and the creation of individual goals for future work.

A portfolio is called a performance-based assessment because the intent of the portfolio is for students to assemble a collection of samples of their work, which in essence shows evidence of their accomplishments. Portfolios may contain creative writing, tests, artwork, exercises, reflective essays, notes on topics, and whatever other materials portray achievement. Standards and criteria for achievement in portfolios should be set. Some of the criteria may include completeness, effort, neatness, and creativity. Portfolios reveal students' patterns of learning and thinking as the year progresses; they also allow both teachers and students to work in the most productive ways possible. There are almost as many approaches to compiling and evaluating portfolios as there are proponents of this form of assessment. Portfolios can be used both formally and informally. Ideally, the portfolio captures the evolution of the student's ideas and can be used instructionally and as progress markers for the student, teacher, and program evaluator.

Portfolios are adaptable to a variety of educational settings. In Fort Worth, Texas, a fifth-grade teacher used them in his math class. Kentucky and Vermont educators have made portfolios a part of their statewide assessment of students. Pittsburgh educators have used portfolios to assess learning in imaginative writing, music, and visual arts.

A portfolio has three major parts: biography, range of works, and reflections. The biography shows the developmental history of the child's progress and gives the reader an impression of how the student has progressed from the beginning to that point. The portfolio contains a range of assignments. These could be the student's "best," "most important," "satisfactory," and "unsatisfactory" pieces of work, as well as revisions. The student critiques his or her work by reflecting on how his or her performance has changed, what he or she has learned, and what he or she needs to do to improve. See Box 17.1 for three portfolio models.

Educators who use portfolios in the 4×4 block believe that these are practical and effective assessment tools for several reasons. Portfolios are easy to design, durable, and reusable. This form of assessment influences the teacher's way of teaching and testing by problem solving, communication, application, and so on and promotes worthwhile learning while expanding the dimensions of education. It provides a developmental perspective that is easily observed by students, parents, and teachers. Finally, it documents a student's progress through school until graduation. Members of the NEA (National Education Association) support the portfolio's use because it accurately reflects what the student has learned.

Not all educators support the portfolio. Some teachers use it to display the best of a student's work. Used this way, it will not accurately reflect performance and rate of progress and cannot be called an assessment measure because, rather than including a representative sampling of a student's work, teachers may guide students about what to write and include. Storage is difficult because a portfolio, if used appropriately, can be big

Box 17.1

Three Portfolio Models

Model 1

I. Introduction—title page
II. Student Portrait—photo or video montage of student
    A. Attendance record
    B. Discipline record
    C. Self-esteem rating
    D. Test scores
III. Educational Goals
    A. Student goals for the year
    B. Career goals
    C. Copies of exceptional work—all discipline areas
IV. Conclusion—reflection
    A. Evaluation of portfolio
    B. Summary paper at end of year—student self-evaluation

Model 2

I. Writing
    A. Submissions from English: literature response, personal essay, research paper
    B. Submissions from history: cause-and-effect paper, defense paper
    C. Submissions from science: classification paper, lab report
    D. Submission of student choice
II. Reading List
III. Conclusion
    A. Self-evaluation of writing and reading goals
    B. Teacher analysis of writing ability—establish goals for next school year

Model 3

I. Student Goals for the School Year
    A. Writing goals
    B. Reading goals
    C. Communication goals
II. Writing Samples
    A. Literature response
    B. Comparative analysis
    C. Journal entry
    D. Research paper
    E. Essay test
    F. Creative writing—poem, short story, etc.
    G. Student choice
III. Editing
    A. Peer evaluation
    B. Self-evaluation
IV. Future Goals for Writing and Reading
    A. List of future goals
    B. Summary of career goals

and bulky. Scoring is time-consuming as well as inconsistent, and even if the scorers do agree, that does not guarantee that the portfolio measures what it was supposed to measure (Viadero, 1995). In Vermont, for example, it took more than 160 scorers five days to assess 7,000 portfolios. In addi-

tion, these scorers were, understandably, influenced by their personal beliefs.

Teachers participating in 4×4 seminars expressed the following suggestions for evaluation success:

Assessment and Evaluation

- Reports
- Team competitions, research projects
- Skills
- Role playing
- Portfolios
- More oral response time, debates
- Team projects
- Self-assessment
- Individual
- Pre- and posttests
- Teacher-student evaluation, one-on-one
- Practical hands-on skill evaluation, theory into practice
- Peer evaluations
- Standardized testing
- Parent conferences
- Ongoing evaluation of program, formative evaluation
- More home involvement
- Nonthreatening evaluations for teachers, opportunities to try things without fear of failure or accountability

Unit Evaluation

Unit evaluation includes two major types of evaluation: diagnostic and summative. Diagnostic evaluation allows the teacher to learn what the students' learning potential is prior to the start of the instruction. Summative evaluation measures what the students have learned through implementation of the unit. The usual form of evaluation is a written test. The unit test can contain a mix of objective (answer with the facts) and subjective (essay) questions. These two types of evaluation assist with the planning of future methods of teaching a unit by providing, through student response to test items, information about how the instruction can be organized to become more effective.

Lesson Evaluation

Lesson evaluation occurs daily. Informal and formal evaluation occurs while the lesson is going on as well as at its completion. Some informal ways of evaluation are observations of the students both individually and as a group, assessment of students' contributions, review of homework, and overall impressions of the level of student understanding and success. Some formal methods of evaluation are quizzes, debates, and rating scales. These evaluations are done constantly throughout the lesson to verify that

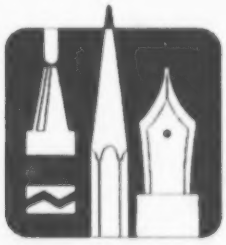
the lesson is being comprehended by the students. They allow for modifications to be made at any point in the lesson.

A POSITIVE CLASSROOM CLIMATE THROUGH INSTRUCTION

Students and teachers learning in a 4×4 model of block scheduling become more active and engage in hands-on activities. The classroom climate is positively affected by this active learning. During the lengthened class period, students and teachers have the opportunity to get to know one another better. Teachers have fewer students in one day and spend longer periods of time with individual students. This one-on-one time helps to build strong relationships between students and teachers.

To improve the classroom climate, a strong management program is important. The classroom management program puts boundaries and limits on student behavior and gives opportunities for the students to learn in a safe environment. Along with more engaging and hands-on learning, students benefit from a warm and inviting environment. The classroom climate will improve if teachers have a positive attitude, are approachable, can create learning activities that are student-friendly, and decorate the classroom in a pleasing and educational manner. The school building itself can also be a warm and nurturing place. Bulletin boards that clearly display upcoming events, lists of students with perfect attendance, lists of awards and honors, honor roll lists and athletic achievements are both visually interesting and communicative. Giant calendars, club-sponsored bulletin boards, and festive holiday decorations make the school more personal and aid in creating a positive learning environment.

EIGHTEEN



Program Evaluation and Student Assessment

Evaluation is the process of determining the worth of any given thing. Evaluation of school programs and of the curriculum is done in order to establish their value. Throughout the history of education, evaluation in these areas has been assessed either formally or informally. Many trends and issues affect evaluation. Evaluation must be carefully considered before, during, and after implementation of a block schedule. In this chapter, I address the "how" and "why" of evaluation in general since the methods and reasons can be applied to any type of program.

Evaluation has many definitions. It can be seen as a product of the work of evaluators, but it is more commonly viewed as a process. The process of evaluation primarily involves two basic acts. It is first the process by which data are gathered so that decisions will be informed. Second, evaluation is the process of applying criteria to the available information in order to arrive at justifiable decisions. In *Perspectives of Curriculum Evaluation*, Michael Scriven (Tyler, Gagné, & Scriven, 1967) explains that evaluation itself is an activity that is essentially similar whether we are trying to evaluate coffee machines or teaching machines, plans for a house, or plans for a curriculum. The method for the activity consists simply in the gathering and combining of performance data with a weighted set of goal scales to obtain either comparative or numerical rat-

ings and in the justification of (a) the data-gathering instruments, (b) the weightings, and (c) the selection of goals.

When evaluating a curriculum or a program, it is necessary to distinguish between the roles associated with evaluation and the goals associated with evaluation. When discussing roles, distinctions must be made as to the role of the principal, the role of the teacher, and the role of the evaluation itself. What will the evaluation be used for? What evaluative instrument will be used? When the question is asked, "What is the goal of evaluation?" the question "Whose goal?" must be answered. The point is that when discussing evaluation, it must be acknowledged that this is a complicated, multifaceted subject, and the terms and their particular usage must be clearly defined every step of the way. The reality is that evaluation should be a continuous process that is part of every stage of curriculum development, program development, and implementation of the two.

REASONS FOR EVALUATION

Evaluation provides the information needed to make changes. Evaluation gives (or should give) direction to everything that is done in school. Evaluation should guide decisions about staffing, materials and equipment, facilities, and scheduling. Evaluation of curriculum and of programs must be done systematically in a way that can be easily explained and replicated. Only then can all involved stakeholders learn from the process. Too often, only those conducting the evaluation have knowledge of the instrument and, later, of the findings. If the information is not shared and understood, there was little reason for conducting or imposing an evaluative process in the first place. In the book *Supervision and Instructional Leadership*, Glickman, Gordon, and Ross-Gordon (2001) discuss the importance of evaluation in education and the way it has recently changed. The public demand for accountability and the advent of high-stakes testing has added new interest to the subject of evaluation. National reform efforts such as Goals 2000 have drawn attention to education. There is great concern over what the children of the nation are learning. Right now, the focus with regard to student learning is performance on standardized tests. Administrators, teachers, and parents want to know how to enable their students to achieve higher test scores. Evaluation is a large part of this. An example shared by the authors of *Supervision and Instructional Leadership* (Glickman et al., 2001) is a look at 15 exemplary elementary and middle schools in three districts that all made significant improvements in mathematics and reading over a three-year period. The common characteristic of these schools was found to be that information about student progress was regularly gathered, and the information was used schoolwide to make decisions about changing curriculum. Every school did not change curriculum in the same way but changed based on the determined needs of the students. The information obtained was also used to guide professional staff development.

DEFINING PROGRAM EVALUATION

The terms *curriculum* and *program* are sometimes used interchangeably but are usually not considered the same thing. A program is often viewed as a specific component of a curriculum. A program can mean an organized set of ideas and plans within a certain discipline that may be used to provide information for students. For example, the term may be used to detail what will be done with a particular group of students in reading. The reading program is only a component of the total curriculum. The word *program* may also be used to mean the overall instructional program. It is acceptable to use the terms in either way as long as the definition used in a particular instance is made clear and the definition is used consistently.

Evaluation must be applied to the programs used within a curriculum. As evaluation is used to determine the worth of anything, evaluation of a program is used to see if the programs have merit, if the programs are working for the students for whom they are used, and if changes need to be made. Glickman et al. (2001) discuss six components that may be considered as one conducts a comprehensive program evaluation. The components are as follows:

Evaluation of Needs Assessment. It is important to determine whether or not there is a need for a program. While this may seem obvious, there is evidence that schools often succumb to good salesmanship and "bandwagon" popularity rather than responding to actual need when choosing programs. Teachers report the frustration that occurs when asked to implement new programs without old programs first being phased out. Layering program on program is confusing. The needs assessment will assist in determining what should continue to have a valid place in the curriculum and what has outlived its usefulness.

Evaluation of Program Design. An essential part of program evaluation is to look at the written plan of a program. It is important to ask if the goals and objectives are consistent with the needs the program is to meet. And it is critical to determine *before* implementation of the program what human and material resources have been committed to the program.

Evaluation of Readiness. When a program fails, it is usually because one or more of the stakeholders (principals, teachers, students, parents, and/or other community members) were not prepared to support implementation of the program. This lack of support may stem from disagreement with the program, lack of understanding about how to implement the program, or a lack of communication about the program. Many times, a good program has had no success because a stakeholder did not understand, like, or feel competent to implement the program as designed.

Implementation Evaluation. The key question to be asked here is, "Was the program implemented as planned?" If the answer to this question is no,

then what was responsible for the error? When a program is implemented, three phases should be considered: (1) the initiation of the program, (2) the continuation of the program, and (3) integration of the program with the school culture. Implementation according to the directives of the program is key. Many programs fail to produce desired results because they are not executed as intended. Principals must fully understand the programs that are to be put into operation in their buildings. Regular monitoring of instruction and program implementation can control what evaluators refer to as "loss of program fidelity."

Evaluation of Outcomes. Two types of outcomes can be measured with program evaluation. *Intended outcomes* are the goals and objectives of the program. *Unintended outcomes* are results that came about but that were not planned for. Unintended outcomes can be positive or negative. Unintended outcomes should be carefully studied, for they provide valuable insight as the "next step" is contemplated.

Cost-Benefit Analysis. When an analysis is applied, evaluators are comparing the benefits of the programs to the cost in terms of the use of human resources, material resources, and dollars spent. Most schools operate with limited resources in all areas, so this is very important.

Program evaluation may be used effectively to make the changes that benefit students whether the changes are for a short time or are more permanent. A principal in North Carolina whose elementary school had adopted a popular mathematics program tells a story about the importance of program evaluation. A prepackaged mathematics program was chosen for use because (a) most of the elementary school leaders in his particular district felt that the program would raise end-of-the-year test scores and (b) the program, since it incorporates the use of many manipulatives and "real-life" situations, would improve math instruction in the school. Teachers follow a script to deliver instruction with this particular package. The program was implemented at the beginning of the school year. The training for how to use the program was very brief because all the material did not arrive until a few days after school had started. Teachers were told to "read the script" and to "stay a couple of days ahead of the kids." After a few weeks of using the program, the fourth-grade teachers approached the principal with the disturbing news that 12 children in the grade level could not keep up with the program. Parents had been contacted about the problem, and the students had been supported in a variety of ways, but the difficulty remained. These particular students had learning difficulties in mathematics, but the discrepancy between ability and performance was not substantial enough to allow them to qualify for diagnosis of a specific learning disability. Therefore, the students could not be placed in a separate learning environment, which would have helped to address their needs. A few of the students struggled because of very low IQs, but again, that alone did not allow them to receive services outside the

regular education classroom. These boys and girls were the students with whom educators constantly struggle. They were the children who fail to meet any criteria for additional services. These were the children who are often referred to as "at-risk" or "falling through the cracks." Their math skills were significantly below grade level, and after two of the program assessments, it was apparent that a change must be made for the struggling students. The principal supported the teachers in their request, trusting in their collective professional abilities to recognize that a change needed to be made. A great deal of time was spent as the principal and the teachers, along with the special education teacher, discussed solutions to the problem. At the heart of each discussion was the desire to create a situation that would provide for the needs of the students who were experiencing such difficulty. The principal provided support as classes were reorganized. He also provided an extra teacher to work in the classroom with the 12 students. The important lesson to be gleaned from this case study is that (a) teacher input was valued, (b) the children for whom the program *was* working were not affected, (c) teaching support was provided so that the group of students working below grade level could make progress faster, and (d) the integrity of the mathematics program was not compromised. The outcome of this program evaluation was that the school gained valuable knowledge about the ability level of these at-risk students. The decisions to act and to support student learning were made, and as a result, there were increased skills for those students as well as significant gains on the end-of-year standardized tests.

When evaluating the overall instructional program, many areas within the school must be looked at because the areas are appreciably related to the success of the program. Glickman et al. (2001) address this issue in *Supervision and Instructional Leadership*. Box 18.1 illustrates the areas they recommend be considered.

INSTRUCTIONAL EVALUATION

A program has been defined as a component of the curriculum. A program may be further broken down into a unit of study. Classroom teachers implement and present information to students in units of study. This presentation is commonly referred to as instruction. Instruction of a unit must also be evaluated. In *Curriculum Practice in the Elementary and Middle School* (Queen, 1999), reference is made to the two major types of evaluation—diagnostic and summative. Through diagnostic evaluation, the teacher identifies what the learning potential of a student is prior to the start of an instructional unit. A summative evaluation is a way of measuring what a student has learned from the presentation of an instructional unit. These methods of evaluation are valuable to the classroom teacher and should not be overlooked by the instructional leader of the school. Regular instructional evaluation is the piece of the evaluation process that should

Box 18.1 Areas to Consider When Evaluating an Overall Instructional Program

Educators must ask themselves . . .

1. What are the characteristics of the community, parents, teachers, and students?
2. What programs are in place that involve parents, the community, and professional development?
3. What are the standards for student achievement, and are students meeting those standards?
4. What is the climate and culture of the school?
5. How is the school governed?
6. What kind of relationships exist between other schools, the central office, and external organizations?

SOURCE: Glickman, Gordon, and Ross-Gordon (2001).

regularly inform the classroom teacher about how to proceed so that the needs of students are met.

The focus today for most school principals is "alignment." This refers to the prescribed objectives of the curriculum "matching up" with instruction delivery, textbooks, and scheduling. There may be the perception that in a state where there is a standard course of study, very specific curriculum and program objectives, and an evaluation that measures these objectives, there is very little that the principal has any control over, at least in the area of curriculum and instruction. This is certainly not the case. An instructional leader in this instance is responsible for knowing the course of study. While it would be ridiculous to imagine a building administrator who has detailed knowledge of the content objectives for every grade level, the principal must have an overall knowledge of what is to be taught at his or her building. Certainly this requires time and effort, but a lack of this knowledge translates to teachers in a very negative way. A principal who is incapable of demonstrating knowledge of what teachers should be teaching cannot be viewed or respected as an instructional leader. It is imperative that principals have knowledge of effective teaching strategies and that they are comfortable sharing those strategies. Principals must recognize the needs that teachers today have and work to create the best possible instructional environment for them.

Important in this era of accountability and reform is the need for the principal who can lead a school community as all involved work to

achieve their greatest potential. More important is the principal who has the ability to communicate a vision to all members of the school community so that boys and girls get the best that entire educational community has to offer. This is sometimes referred to as the ability to transform.

Principals interested in taking their place as the instructional leaders of their schools must consider three key features, according to Henderson and Hawthorne (2000) in *Transformative Curriculum Leadership*. The first item to consider is action research. When principals examine their own practices and encourage teachers to do the same, there is a greater understanding within the entire community about what is happening and why. The second item to consider is dialogue. Good dialogue can help educators avoid the type of curriculum activity that serves no purpose. When dialogue is focused around the needs of the students and teachers of the school, then everyone is supported in doing the best possible work. Dialogue that is helpful acknowledges the contributions of all involved, recognizes the merit of alternative viewpoints, and subscribes to a theory that different is just different—not good or bad. Finally, principals and other members of the educational community recognize the ongoing nature of evaluation. The gathering of information is ongoing, the interpretation of the information is ongoing, and the practical application of the gathered information is ongoing.

The reality for today's school principal is that there is little hope for the school without an instructional leader. And the losers, when there is no instructional leader, are the children within that school. Administrators who understand the value of evaluation can begin the transformation within the school.

SUMMARY ■

Evaluation is an important part of the issue of school reform and school transformation. The entire educational community must be a part of any change that is to take place, but change cannot be made simply for the sake of change. Instructional leaders of the schools must know what needs to be changed and must be able to guide the school community through change. Decisions must be based on careful and intentional evaluation. The instructional leader must also understand the dynamics that occur when change is introduced into an organization. Evaluation means assessing the value of something. Regularly determining the value and the effectiveness of the curriculum, the programs, and the instruction in a school is the way to ultimately offer the best to the students in the school.

The chapter ends with two tools for evaluation before and after a school implements block scheduling. Evaluation Resource 1 is a preassessment survey that can be used to determine a school's interest in and attitudes toward block scheduling. Evaluation Resource 2 can be used to assess the use of, preference for, and training in classroom instructional practices for teachers from schools that use block scheduling.

EVALUATION RESOURCE 1

Block Schedule Teacher Survey

Please take a few minutes to complete the items on both sides of this sheet. Thank you.
Use the following scale to answer each question:
1 = Very High (VH), 2 = High, 3 = Average, 4 = Below Average, 5 = Low, 6 = Very Low (VL).

	VH					VL
1. Effectiveness of block scheduling relative to student achievement?	1	2	3	4	5	6
2. Effectiveness of block scheduling relative to use of instructional time?	1	2	3	4	5	6
3. Effectiveness of block scheduling relative to instructional pacing?	1	2	3	4	5	6
4. Effectiveness of block scheduling relative to "completeness" of course?	1	2	3	4	5	6
5. Overall rating of the effectiveness of block scheduling?	1	2	3	4	5	6

Use the following scale to respond to these items:
1 = Very Strongly Agree (VSA), 2 = Strongly Agree, 3 = Agree,
4 = Disagree, 5 = Strongly Disagree, 6 = Very Strongly Disagree (VSD)

As a result of block scheduling,

	VSA					VSD
6. Fewer class changes result in safer and more secure school grounds.	1	2	3	4	5	6
7. I am able to vary the instructional methods I use to keep students actively engaged.	1	2	3	4	5	6
8. I am more involved in my school's curriculum and decision making.	1	2	3	4	5	6
9. I am better able to meet the needs of students at differing levels of ability.	1	2	3	4	5	6

Tell us about yourself and how you teach:

10. Total years of teaching experience?
    a. first-year teacher b. 2–5 years c. 6–10 years d. 11–20 years e. more than 20 years

11. Typical percentage of time spent in interactive instruction with students?
    a. less than 20% b. 21–40% c. 41–60% d. 61–80% e. more than 80%

12. Typical percentage of time spent monitoring independent work of students?
    a. less than 20% b. 21–40% c. 41–60% d. 61–80% e. more than 80%

13. Typical percentage of time spent handling classroom management problems?
    a. less than 20% b. 21–40% c. 41–60% d. 61–80% e. more than 80%

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Tell us what you think of block scheduling.

14. List in priority order characteristics or teaching skills of a master teacher in block scheduling.

a. _____ b. _____

c. _____ d. _____

e. _____ f. _____

15. List some benefits of block scheduling.

a. _____ b. _____

c. _____ d. _____

e. _____ f. _____

16. List some problems with block scheduling.

a. _____ b. _____

c. _____ d. _____

e. _____ f. _____

17. What kind of assistance do teachers need to better deliver instruction when using a block scheduling model?

_____

_____

Note: Special thanks to Elaine Jenkins who assisted in the design of the original instrument under my direct supervision. This is a modified and improved version.

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EVALUATION RESOURCE 2

TEACHER SURVEY: HIGH SCHOOL INSTRUCTION

The following sections request information about your classroom instructional practices, your recent staff development experiences, and your teaching experience/workload. Please provide answers directly on the survey.

I. Classroom Instructional Practices

Please select the statement that *best describes* your level of use, preference, and training for each of the following instructional practices.

Cooperative Learning *(Cooperative learning is the practice of grouping students in small, mixed-ability learning teams. The teacher presents the group with a problem to solve or task to perform. Students then work together to achieve a group performance score by helping one another and praising and criticizing one another's contributions.)*

Level of Use

A. I *do not use/do not have time to use* cooperative learning in my classroom.
B. I use cooperative learning activities *very seldom* (e.g., once or twice during the course I teach).
C. I use cooperative learning activities *seldom* (e.g., once or twice during each grading period).
D. I use cooperative learning activities *often* (e.g., once a week).
E. I use cooperative learning activities *very often* (e.g., every day).

Level of Preference

A. I do not prefer cooperative learning as a teaching practice for my subject.
B. Cooperative learning is an appropriate practice that can be used occasionally in my subject area.
C. Cooperative learning is a practice that is well suited to my course content.

Level of Training

A. I have had *no training* in cooperative learning.
B. I have had *some training* but not enough to implement.
C. I have had *extensive training* in cooperative learning and understand it well.

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Discovery Learning *(Discovery learning involves hands-on, experiential, intentional learning through teacher-directed problem solving activities.)*

Level of Use

A. I *do not use/do not have time to use* the discovery learning in my classroom.
B. I use discovery learning *very seldom* (e.g., once or twice during the course I teach).
C. I use discovery learning *seldom* (e.g., once or twice during each grading period).
D. I use discovery learning *often* (e.g., once a week).
E. I use discovery learning *very often* (e.g., every day).

Level of Preference

A. I do not prefer discovery learning as a teaching practice for my subject.
B. Discovery learning is an appropriate practice that can be used occasionally in my subject area.
C. Discovery learning is a practice that is well suited to my course content.

Level of Training

A. I have had *no training* in the discovery learning.
B. I have had *some training* but not enough to implement.
C. I have had *extensive training* in discovery learning and understand it well.

Lecture *(A lecture is an instructional practice in which the teacher gives an oral presentation of facts and principles, with the students frequently being responsible for note taking.)*

Level of Use

A. I *do not use/do not have time to use* lecture in my classroom.
B. I use lecture *very seldom* (e.g., once or twice during the course I teach).
C. I use lecture *seldom* (e.g., once or twice during each grading period).
D. I use lecture *often* (e.g., once a week).
E. I use lecture *very often* (e.g., every day).

Level of Preference

A. I do not prefer lecture as a teaching practice for my subject.
B. Lecture is an appropriate practice that can be used occasionally in my subject area.
C. Lecture is a practice that is well suited to my course content.

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Level of Training

A. I have had *no training* in lecture.
B. I have had *some training* but not enough to implement.
C. I have had *extensive training* in lecture and understand the concept well.

Direct Instruction (*When using direct instruction approaches, the teacher structures lessons in a straightforward sequential manner, discussion, worksheets, and drill.)*

Level of Use

A. I *do not use/do not have time to use* direct instruction in my classroom.
B. I use direct instruction *very seldom* (e.g., once or twice during the course I teach).
C. I use direct instruction *seldom* (e.g., once or twice during each grading period).
D. I use direct instruction *often* (e.g., once a week).
E. I use direct instruction *very often* (e.g., every day).

Level of Preference

A. I do not prefer direct instruction as a teaching practice for my subject.
B. Direct instruction is an appropriate practice that can be used occasionally in my subject area.
C. Direct instruction is a practice that is well suited to my course content.

Level of Training

A. I have had *no training* in direct instruction.
B. I have had *some training* but not enough to implement.
C. I have had *extensive training* in direct instruction and understand the concept well.

Simulation *(A simulation is a representation of a manageable real event in which the learner is an active participant engaged in acquiring a new behavior or in applying previously acquired skills or knowledge.)*

Level of Use

A. I *do not use/do not have time to use* simulation in my classroom.
B. I use simulation *very seldom* (e.g., once or twice during the course I teach).
C. I use simulation *seldom* (e.g., once or twice during each grading period).
D. I use simulation *often* (e.g., once a week).
E. I use simulation *very often* (e.g., every day).

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Level of Preference

A. I do not prefer simulation as a teaching practice for my subject.
B. Simulation is an appropriate practice that can be used occasionally in my subject area.
C. Simulation is a practice that is well suited to my course content.

Level of Training

A. I have had *no training* in simulation.
B. I have had *some training* but not enough to implement.
C. I have had *extensive training* in simulation and understand the concept well.

Field Trips *(When using field trips, teachers take students to a specific location where they may study or observe real things in direct interaction with specified concepts and/or skills to be learned.)*

Level of Use

A. I *do not use/do not have time to use* field trips in my classroom.
B. I use field trips *very seldom* (e.g., once or twice during the course I teach).
C. I use field trips *seldom* (e.g., once or twice during each grading period).
D. I use field trips *often* (e.g., once a week).
E. I use field trips *very often* (e.g., every day).

Level of Preference

A. I do not prefer field trips as a teaching practice for my subject.
B. Field trips are an appropriate practice that can be used occasionally in my subject area.
C. Field trips are a practice that are well suited to my course content.

Level of Training

A. I have had *no training* in integrating field trips into instruction.
B. I have had *some training* but not enough to implement.
C. I have had *extensive training* in field trips and understand the practice well.

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Student peer coaching/peer tutoring *(Peer coaching/peer tutoring involves students teaching other students either in cross age grouping or within their own class.)*

Level of Use

A. I *do not use/do not have time to use* peer coaching/peer tutoring in my classroom.
B. I use peer coaching/peer tutoring *very seldom* (e.g., once or twice during the course I teach).
C. I use peer coaching/peer tutoring *seldom* (e.g., once or twice during each grading period).
D. I use peer coaching/peer tutoring *often* (e.g., once a week).
E. I use peer coaching/peer tutoring *very often* (e.g., every day).

Level of Preference

A. I do not prefer peer coaching/peer tutoring as a teaching practice for my subject.
B. Peer coaching/peer tutoring is an appropriate practice that can be used occasionally in my subject area.
C. Peer coaching/peer tutoring is a practice that is well suited to my course content.

Level of Training

A. I have had *no training* in peer coaching/peer tutoring.
B. I have had *some training* but not enough to implement.
C. I have had *extensive training* in peer coaching/peer tutoring and understand the practice well.

Audiovisual Experiences *(When providing audiovisual experiences, teachers use films, videos, tape recordings, and other media presentations to deliver the content of their instruction.)*

Level of Use

A. I *do not use/do not have time to use* audiovisual resources in my classroom.
B. I use audiovisual resources *very seldom* (e.g., once or twice during the course I teach).
C. I use audiovisual resources *seldom* (e.g., once or twice during each grading period).
D. I use audiovisual resources *often* (e.g., once a week).
E. I use audiovisual resources *very often* (e.g., every day).

Level of Preference

A. I do not prefer audiovisual resources as a teaching practice for my subject.
B. Audiovisual experiences are an appropriate practice that can be used occasionally in my subject area.
C. Audiovisual resources are a practice that is well suited to my course content.

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Level of Training

A. I have had *no training* in integrating audiovisual resources in instruction.
B. I have had *some training* but not enough to implement.
C. I have had *extensive training* in audiovisual resources and understand the practice well.

Technology Assistance (*Technology-assisted instruction involves the use of computers to assist in instruction of basic facts, skills, and concepts related to the subject as well as drill and practice, tutorial, gaming, simulation, discovery, problem solving, and other activities.)*

Level of Use

A. I *do not use/do not have time to use* technology assistance in my classroom.
B. I use technology assistance *very seldom* (e.g., once or twice during the course I teach).
C. I use technology assistance *seldom* (e.g., once or twice during each grading period).
D. I use technology assistance *often* (e.g., once a week).
E. I use technology assistance *very often* (e.g., every day).

Level of Preference

A. I do not prefer technology assistance as a teaching practice for my subject.
B. Technology assistance is an appropriate practice that can be used occasionally in my subject area.
C. Technology assistance is a practice that is well suited to my course content.

Level of Training

A. I have had *no training* in computer/telecommunications.
B. I have had *some training* but not enough to implement.
C. I have had *extensive training* in technology assistance and understand the use of computers well.

Small Groups/Structured Pairs (*Students are organized into small groups to discuss/review a concept/learning objective or to complete a teacher-directed assignment.)*

Level of Use

A. I *do not use/do not have time to use* small groups/structured pairs in my classroom.
B. I use small groups/structured pairs *very seldom* (e.g., once or twice during the course I teach).
C. I use small groups/structured pairs *seldom* (e.g., once or twice during each grading period).
D. I use small groups/structured pairs *often* (e.g., once a week).
E. I use small groups/structured pairs *very often* (e.g., every day).

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Level of Preference

A. I do not prefer small groups/structured pairs as a teaching practice for my subject.
B. Small groups/structured pairs is an appropriate practice that can be used occasionally in my subject area.
C. Small groups/structured pairs is a practice that is well suited to my course content.

Level of Training

A. I have had *no training* in small groups/structured pairs.
B. I have had *some training* but not enough to implement.
C. I have had *extensive training* in small groups/structured pairs and understand the practice well.

Projects *(When using projects, teachers have students work on a task for an extended time period, alone or in small groups, usually to produce a tangible product.)*

Level of Use

A. I *do not use/do not have time to use* student projects in my classroom.
B. I use student projects *very seldom* (e.g., once or twice during the course I teach).
C. I use student projects *seldom* (e.g., once or twice during each grading period).
D. I use student projects *often* (e.g., once a week).
E. I use student projects *very often* (e.g., every day).

Level of Preference

A. I do not prefer student projects as a teaching practice for my subject.
B. Using projects is an appropriate practice that can be used occasionally in my subject area.
C. Using projects is a practice that is well suited to my course content.

Level of Training

A. I have had *no training* in student projects.
B. I have had *some training* but not enough to implement.
C. I have had *extensive training* in student projects and understand the use of projects well.

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II. Staff Development Experiences

Please indicate whether you have participated in staff development (at least 4 hours) within the last five years on the following topics and the extent to which the staff development was helpful to you in your classroom.

Helpfulness Scale

	Did Not Participate	Not Helpful	Helpful	Very Helpful
Pacing guides	NO	A	B	C
Curriculum alignment/audit	NO	A	B	C
Discipline-specific planning within departments	NO	A	B	C
Alternative assessments/evaluation methods	NO	A	B	C
How to make effective use of class time	NO	A	B	C
Dimensions of learning	NO	A	B	C
Models of teaching	NO	A	B	C
Student learning styles	NO	A	B	C

Do you have adequate access to technology (e.g., computers, CD ROMs, etc., to use in support of instruction?

_____ Yes _____ No

III. Teaching Experience/Workload

How many years have you been teaching? _____
How many classes do you currently teach this semester? _____
How many course preparations do you have this year? _____

How are you involved in instructional decision making in your school?

Serve on school improvement team	YES	NO
Serve as a department chair	YES	NO
Serve on an instructional planning committee	YES	NO
Serve on an instructional technology committee	YES	NO
Serve on a SACs Committee	YES	NO

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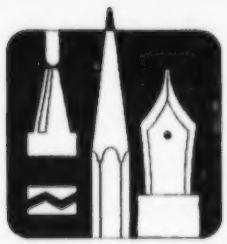


A Guide to Traditional and Authentic Assessment

It is clear that measuring student achievement constitutes a substantial portion of the practitioner's charge. I believe that block scheduling contributes substantially to student achievement, but measuring students' progress is necessary no matter what type of schedule a school has. How else will the institution determine if its curricular presentation and instructional practices are producing results? Although one may choose from many forms of assessment, all have the common end of evaluating programs and instruction. Politicians, parents, practitioners, and students have a considerable interest in measuring student performance. Basic knowledge of the various phases and types of assessment present in today's educational world is essential in understanding the assessment process and the need for multiple approaches. Following is a guide to both traditional and authentic assessment. It may be used to create checklists, slides, or other useful tools for student assessment.

When it comes to student assessment there tends to be an overuse of one or two procedures. It is important for teachers to realize that regardless of the scheduling format, the major purpose of assessment is to check to see how the student is mastering the content. Block scheduling allows the teacher more time to do more hands-on assessment such as presentations, projects that can be done in class—not just pencil-and-paper tests.

STUDENT ASSESSMENT

PART ONE

Writing and Evaluating Test Items

OVERVIEW

- Parts of a Test Item
- Categorizing Items
- Evaluating Test Items

Parts of a Test Item—Stems

The Stem

- The part of the question that gives the situation and delineates the task to be addressed.

Two Types of Stems

- Open stem
  An incomplete sentence is provided and the answer choices must finish the sentence.
- Closed stem
  A complete question is provided.

Parts of a Test Item—Stems

General Rules for Stems

- Keep the stem concise to minimize reading time
- Include only relevant information
- The stem should be as complete as possible
- Use present tense whenever possible
- Students should know exactly what the question is asking of them

AVOID

- Stereotyping any age or gender group
- Using "politically incorrect" terms
- Using negative stems such as except, not, least, etc.

DO

- Use a nonsexist writing style; if it is impossible, write the stem clearly and concisely without using the pronouns "his," "her," etc.
- Have an equal number of males and females in the stems
- Resist the use of clever names that may distract students
- If names are used, restrict them to first names or surnames

Parts of a Test Item—Options

Options

- All of the answer choices for a question.

Two types of options

- Key
  The correct option.
- Distracters
  The incorrect options.

Parts of a Test Item—Options

General Rules for Options

- There should be one single best option that students *with the appropriate knowledge* will recognize
- Distracters should not be easily recognizable as choices
- Distracters should be plausible to students *without the necessary knowledge* required to answer the question correctly
- Options should be about the same length, level of complexity, and detail
- If all options can't be the same length, make two long options and two short options
- Word the distracters clearly and concisely
- Distribute the position of the key randomly
- If applicable, use a logical basis for ordering options

AVOID

- Using disparaging remarks in options so that the options are obviously wrong.
- Making the key part of a pair of similar or contrasting options
- Using the words "never" "ever" and "always" as an option
- Using the terms "all of the above" or "none of the above"
- Using "multiple multiples" as options
  Example: A & B, C & B
- Making a distracter wrong for a minor reason causing an answer error under the stress of testing

DO

- Make sure the key does not include one of the distracters
  Example: the distracter is "mix the chemicals" & the key is "mix the chemicals and turn on the Bunsen burner"
- Make sure the distracters do not include the key within their range
  Example: the distracter is "more than 5" and the key is "more than 10"
- If you find that the options begin with the same words or phrases, put this in the stem
  Example: Every option begins with the words "add the . . ."
- If any words from the stem appear in the key, make sure they appear in the distracters as well

Categorizing Items on Cognitive Levels

Knowledge

- Remembering or recognizing appropriate terminology, facts, ideas, materials, trends, sequences, methodology, principles, and generalizations

The capital of Turkmenistan is:

A.) Ulaanbaatar
B.) Bishkek
C.) Astana
D.) Ashbagat *

Categorizing Items on Cognitive Levels

Comprehension

- Understanding written communication, reports, tables, diagrams, directions, regulations, maps, etc.

The exploration to Lake Tanganyika began at .

A.) Dodoma
B.) Arusha *
C.) Ujiji
D.) Tabora

Categorizing Items on Cognitive Levels

Application

- Applying ideas, rules of procedure, methods, formulas, principals, and theories in situations

In a walkathon to raise money for charity, Laura walked a certain distance at 5 mph, then jogged twice that distance at 8 mph. Her total time walking and jogging was 2 hours and 15 minutes. How many miles long was the walkathon?

A.) 10 miles
B.) 12 miles
C.) 15 miles *
D.) 17 miles

Formula: rate x time= distance

Categorizing Items on Cognitive Levels

Analysis/Synthesis

- Breaking down or putting together material or information in relation to its constituent parts and detecting the relationship of the parts and the way they are organized

What was a major reason many former colonies in Africa experienced internal strife after achieving independence?

A.) Colonial borders had separated culturally similar people and enclosed traditional enemies.*
B.) The new nations wanted to form governments which were radically different.
C.) The new governments wanted to nationalize the many industrial complexes.
D.) There were too many diverse languages in the former colonies for effective communication.

Evaluating Test Items

Reliability

- The consistency of test scores
  Would a student score about the same on the test if he/she were to take it today and again next month?

- Improve the individual items through the process of item analysis
  Item analysis includes the following:
  - A review of the item's difficulty level
  - Discrimination data
  - The effectiveness of the distracters

Evaluating Test Items

Difficulty Level

- The *p*-value (or difficulty level) refers to the percentage of students who answered the question *correctly*.
  Therefore, a *p*-value of 0.95 means that 95% of the students answered it correctly

- Items that are too easy or too difficult take away from the test's reliability—they *don't discriminate* between those who know the material from those who do not

Evaluating Test Items

Determining Difficulty Level

- To determine the difficulty level, use the following formula:
  $$\frac{\text{\# of students answering correctly}}{\text{total \# of students}}$$

- Look at any questions that have
  p-value of 0.30 or less
  *Check to make sure the key is correct first!
  p-value of 0.90 or more
  *Criterion-referenced questions should be above 0.90.

Evaluating Test Items

Discrimination Index

Item discrimination indicates how well the item discriminates between the high-scoring and low-scoring students.

- Index of 0.00 means the item didn't discriminate at all between groups.
- Index of 0.20 to 0.29 indicates a reasonably good item.
- Index of 0.30 or higher is great!
- Negative discrimination occurs when the low group scores better on the item than the high group.

Evaluating Test Items

Determining Discrimination Index

To determine the discrimination index, use the following formula:

% students high group* answering correctly – % students low group* answering correctly = discrimination index

*Use the top 27% and bottom 27% of the scores on the test

Example:
10 of 14 high students got the item correct = 0.71
7 of 14 students got the item correct = 0.50
0.71 – 0.50 = a discrimination index of 0.21

Evaluating Test Items

Effectiveness of Distracters

- Look at the distribution of answers among the distracters given in the item
- If a distracter has not been chosen, it may not be effective and needs to be changed to something more plausible
- If student numbers taking the test are low, you may want to wait for another testing with the item to see if the distracter is chosen with the second group

  Remember to keep the first data!

Evaluating Test Items

Analyzing Item Data

- Review the Difficulty Index

  Look at the items that have either very low or very high *p*-values
- Review the Discrimination Index

  Look at items that have low or negative values of discrimination
- Review the Effectiveness of Distracters

  Look at distracters that were not chosen by students
- Review the "history" of the item's data

  Data may change with teaching techniques, the "student grapevine," etc.

Example:

For a community project, an advanced biology student chose to teach groups about the prevention of various urinary and kidney diseases. When preparing material about the prevention of acute glomerulonephritis, the student will stress prevention through the proper treatment of

A) Influenza ***B) High cholesterol***
C) Strep throat* ***D) Gonorrhea***

Item Data

Data came from 2 testing times that were 1 year apart

Total # of students: 135
Difficulty index: 0.77 and 0.68
Discrimination index: 0.33 and 0.36
Effectiveness of distracters: All distracters chosen

STUDENT ASSESSMENT

PART TWO

Using Authentic Assessment for Student Evaluation

The trouble with tests is . . .

- "I'm just not good at taking tests."
- "You asked all the wrong questions."
- "I know a lot more than the test tells you."
- "Let me prove to you that I have learned."
- "Tests are dumb."

What is authentic assessment?

- Movement from paper and pencils tests
- Includes genuine, useful, applicable, practice-based, transferable, and demonstrable items
- Includes skills, knowledge, and attitudes that can be carried beyond the classroom
- Goes beyond true/false examination

(For more information see Merrell, 1998)

Why do students need authentic assessment?

- It helps to develop better brains!
  1967—Brain pioneer Marian Diamond of UCLA discovered that the brain can literally grow new connections with environmental stimulation:

  "When we enriched the environment, we got brains with a thicker cortex, more dendritic branching, more growth spines, and larger cell bodies."

  This indicates the brain cells communicate better with each other and have more support cells.
- This research suggests that the environment impacts the wiring of the brain as much as the person's actual experiences.

(For more information see Jensen, 1998)

How to Maximize Brain Growth

William Greenough, an expert on brain enrichment, emphasizes that two things are vital components of growing a better brain:

Challenge

- Learning should include opportunities for problem solving and critical thinking.
- Provide new information and/or experiences in projects that are relevant to the students.
- If there is too much or too little information or experience, students will get bored or give up.
- Vary time, materials, lessons, pedagogy.

Feedback

- Feedback reduces uncertainty and increases coping abilities.
- Brain self-references: It decides what to do based on what has just been done.
- Feedback is most useful when it is immediate and specific, when it is learner controlled, and when it is presented in several ways.

(For more information see Jensen, 1998)

Brain Enrichment

- Challenging problem solving: Problem solving not limited to one part of the brain

  Can solve a problem on paper, with an analogy or metaphor, with a model, by discussion, with statistics, through artwork, or during a demonstration

- Critical to expose students to a variety of approaches to solving a problem

Enrichment & Attention

- Students must be primed: They will learn better if they are told to look for new information or prompted to its location
- Learning must be relevant, engaging, and chosen by the learner

Direct Instruction Learning Times

- Grades K-2: 5-7 minutes
- Grades 3-7: 8-12 minutes
- Grades 8-12:12-15 minutes

After learning, the brain needs time for processing and rest; teachers must rotate activities.

(For more information see Gardner, 1993; Jensen, 1998)

How Do We Enrich Student Learning?

Authentic Assessment

Effective Implementation of Authentic Assessment (Rural School and Community Trust, 2001)

- Articulate the goals of instruction clearly.
  1. What should students know, understand, and be able to do? What important cognitive skills do you want students to develop?
     - Communicate effectively orally and in writing
     - Analyze issues using primary source and reference materials
     - Use the scientific method
  2. What social and affective skills do you want students to develop?
     - Work independently and also cooperatively with others
     - Be persistent in the face of challenges
     - Have confidence in their abilities
  3. What metacognitive skills do I want my students to develop?
     - Discuss and evaluate their problem-solving strategies
     - Formulate efficient plans for completing independent projects
     - Reflect on the writing process they use, evaluate its effectiveness, and derive their own plans for how it can be improved
  4. What types of problems do you want them to solve?
     - Know how to do research
     - Predict consequences
     - Make healthy choices
  5. What concepts and principles do I want them to be able to apply?
     - Understand cause-and-effect relationships in history and everyday life
     - Criticize literary works based on plot, setting, motive, etc.
     - Understand and recognize the consequences of substance abuse

Effective Implementation of Authentic Assessment

- Determine valid and appropriate evidence for meeting instructional goals.
  1. How will we know when students understand what we most want them to understand?
     Standards for Student Work in Mathematics (Newmann, Lopez, & Bryk, 1998)
     - Mathematical analysis: Students demonstrate thinking by going beyond simple recording and reproducing of algorithms.
     - Mathematical concepts: Students demonstrate understanding by representing concepts in different contexts or real-world application.
     - Written mathematical communication: Students demonstrate elaboration of their understanding in the form of diagrams or symbolic representations.
     - Habits of study and work: Students demonstrate skills by using time wisely, completing work on time, and showing initiative.

- Ensure that assessment tasks are complex, realistic, and generate multiple sources of data.
  1. Does the task require students to display their knowledge on multiple dimensions?
  2. Are the genres, contexts, and content typical of real-world work in this area?
  3. Does the task produce evidence that can be evaluated upon completion?

Effective Implementation of Authentic Assessment

- Construct clear, well-understood rubrics for assessing student products.

  What differentiates levels of student performance—from excellent to insufficient—on the various components required by the task?

Three types of rubrics

Particular Trait Rubrics	Analytic Rubrics	Holistic Rubrics
Single out one or two criteria to evaluate in a complex performance and ignore other elements for purposes of assessment.	Track all the criteria or standards demonstrated by students in a performance and allow for individual ratings of each one.	Merge all the criteria into a comprehensive description of the performance.
They provide especially targeted information.	They require more than one score for each piece of student work, providing more detailed information about a student's performance.	The benefit is to assess the student's overall performance on a particular task; they also allow for comparing work over time.

Effective Implementation of Authentic Assessment

- Involve students in developing rubrics and evaluating their own work.

Self-Evaluation Check List for Expository Essay

Initial each statement that you feel describes your work. Explain any things you cannot initial, giving reasons. Attach this to your paper.

_____ My paper has a definite purpose: it works.
_____ My title indicates my point or slant.
_____ I had a specific audience in mind as I wrote and revised.
_____ The details and word choices paint the right picture and give the right feel.
_____ I can explain why I placed every punctuation mark as I did.
_____ Each paragraph contains a clear idea and topic sentence.
_____ I checked each sentence to make sure it was complete.
_____ The transitions are smooth.
_____ The ending is effective in wrapping things up.

(For more information see Perrone, 1992)

Multiple Intelligence and Authentic Assessment

- Multiple intelligences and authentic assessment are natural partners.
- Several optional assessment formats may be implemented based on a student's dominant intelligence.
- Optional assessments blend cohesively with the many types of authentic assessment.

Multiple Intelligences

Verbal/Linguistic

- Debates
- Portfolios
- Quotation reactions
- Rough drafts/final drafts
- Vocabulary
- Word associations

Logical/Mathematical

- Experiment logs
- Logic exercises
- Pattern games
- Rubrics
- "What if" exercises

Visual/Spatial

- Flow charts/graphs
- Hands-on demonstration
- Photo albums
- Scrapbooks
- Murals/montages

Body/Kinesthetic

- Case studies
- Charades/mimes
- Dramatizations
- Skill demonstration
- Physical exercise routines

Musical/Rhythmic

- Checklists
- Creating raps/songs
- Musical performances
- Orchestrating music
- Dances

Multiple Intelligences and Authentic Assessment

Interpersonal

- Buzz sessions
- Group jigsaw puzzles
- Project rosters
- Scavenger hunts
- Think/pair/share

Intrapersonal

- Autobiographical stories
- Feelings diaries/logs
- Individual conferences
- Reflections
- Self-study reports

Naturalist

- Recognizes flora and fauna
- Makes consequential distinctions in the natural world
- Includes farmers, botanists, conservationists, biologists, environmentalists

Types of Authentic Assessment

Graphic Organizers

- The mind spontaneously organizes information as it is learned
- Graphic organizers help to visually organize new information.
- Represent similarities and differences
- Detect patterns and relationships
- Relate new information to previous learning
- Link interdisciplinary topics
- Display information, ideas, and concepts
- Types of Graphic Organizers
  Webbing
  Cause/Effect
  Story Map
  Venn Diagram
  Double Bubble

(For more information see Tombari & Borich, 1999)

Types of Authentic Assessment

Self-Assessment

- Self-assessment allows students the opportunity to evaluate their performance or product.
- Evaluation leads to self-correction and improvement.
- Self-assessment provides student ownership and analysis of products.

Methods

- Video Reflection
- Student-Led Conferences
- Journals

Types of Authentic Assessment— Self-Assessment

Video Reflection

- Use of videotape to assess and improve performance in areas of chorus, band, physical education, or the arts
- Teacher or proficient student models the desired production
- Use rubric for presentation

Implementation of Video Reflection

Application: High school chorus
Objective: Students will sing a ballad in stratified vocal sections. Teacher will model a ballad demonstrating the criteria needed for the production

- Video is made of students singing in groups of mixed vocal sections
- Students use teacher-generated rubric to assess strengths and weaknesses upon review of the video

Types of Authentic Assessment— Self-Assessment

Student-Led Conferences

- Conference with parents led by students
- Teacher = Facilitator
- Several conferences conducted at once in classroom (teacher circulating in room)
- Discussion centered around student portfolio of work
- Collection of student work
- Shows academic progress over time

(Bailey & Guskey, 2001)

Types of Authentic Assessment—Self-Assessment

Implementation of Conferences

BEFORE	DURING	AFTER
Set learning objectives and work with students to create portfolio of work.	Circulate around to each family group and make individual student comments.	Schedule extra time with parents if follow-up needed.
Build in reflection/edit time and role-play conferences with students.	Facilitate when needed.	Read and process evaluations from parents and students.
Prepare a family-friendly environment.	Express gratitude for parental involvement.	Debrief process with students.

Types of Authentic Assessment—Self-Assessment

Journals

- Use of non-structured writing to evaluate short stories and novels
- Permits personal reflection/writing
- Allows for synthesis of ideas and evaluations rather than rigid mechanical corrections
- Can be used as a dialogue between student and teacher

Implementation of Journals

Application: Middle school Language Arts
Objective: Students will reflect in their journals using the following questions from Chapter 14 and 15 of *A Day No Pigs Would Die:*

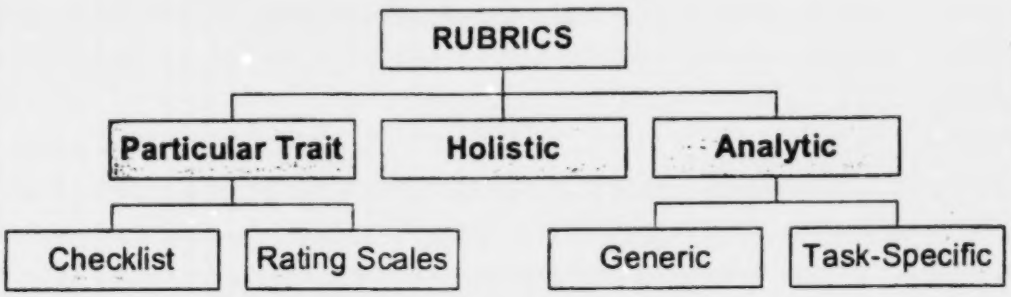
1. If faced with the same dilemma as Rob, would you have had the courage to act as he did?
2. Do you think the ordeal with Pinky made Rob a stronger young man? How?
3. What do you perceive as Rob's new challenges as man of the house at 15?

Types of Self-Assessment

Rubrics

- A guide for evaluating student work
- Use specific criteria to assess project mastery
- Allow for a variety of student skills to be assessed
- Hold learners to high levels of achievement
- Minimize scoring subjectivity and bias
- Can be generated by both teacher and student

Types of Rubrics



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Types of Self-Assessment—Rubrics

Particular Trait Rubrics

Checklist:

- Discrete, observable behaviors
- Observer only watches to see if behavior occurred or not
- Extremely efficient
- Require simple judgments
- Used as diagnostic tools

Rating Scales:

- Assessing complex products
- Assigns numbers to certain levels or degrees of performance
- Continuum that indicates the frequency or quality of the behavior
- Requires more time than checklists

(For more information see Tombari & Borich, 1999)

Types of Self-Assessment—Rubrics

Holistic Rubrics

- Observer estimates the overall quality of the product, demonstration, or exhibit
- Assigns numerical value to that overall quality
- Gives an index of performance
- Requires only one judgment
- Cannot serve as diagnostic rubric since specific strengths and weaknesses are not noted

Types of Self-Assessment—Rubrics

Analytic Rubrics

Generic:

- May be broadly applied to several assignments in varying disciplines
- Useful because of time saved and broad use possible

Task-specific:

- Allows for analysis of specific learning outcomes
- Relevant to one content topic
- Can provide a framework for concepts to be learned and then assessed

Types of Self-Assessment—Rubrics

Developing Analytic Rubrics

- Measure your goals

Learning outcomes should match rating assessment

- Will you expect evidence of knowledge acquisition?
  - Design a rating scale that reflects this
- Do you wish to assess problem-solving strategies?
  - Rating scales should assess their use
- Will you be observing the processes learners show as they complete the task?
  - A checklist may need to be constructed

(For more information see Tombari & Borich, 1999)

Types of Self-Assessment—Rubrics

Developing Analytic Rubrics

- Select an appropriate scoring system
  - Particular trait rubrics
    - Checklists
    - Rating scales
  - Holistic rubrics
  - Analytic rubrics
    - Generic
    - Task specific

(Tombari & Borich, 1999)

Types of Self-Assessment—Rubrics

Developing Analytic Rubrics

- Identify the criteria to be evaluated
  - Type of criteria (varies per type of rubric)
    - Conceptual understanding
    - Systematic approach to task?
    - Is the answer correct?
    - Is the work presented neatly?
  - A successful approach:
    - Consider the task and imagine an excellent student's response to it!
  - Select the number and detail of criteria
    - All important aspects of performance should be found in the criteria
    - Each criteria should be specific, but not too detailed
  - Use subcriteria or elements when necessary and relevant

(For more information see Danielson & Abrutyn, 1997)

Types of Self-Assessment—Rubrics

Developing Analytic Rubrics

- Decide on the number of points for the rubric
  - Detail in distinctions
    - Larger numbers of points can provide specific feedback, but can be cumbersome
    - Limit rubrics to 4-6 points
  - Divide the line between acceptable and unacceptable performance
  - Provide general headings for different points

Types of Self-Assessment—Rubrics

Developing Analytic Rubrics

- Writing the descriptions of performance levels should include:
  - The language used
    - Serve to further define the criteria
    - Use positive rather than negative wording
  - All subcriteria or elements defined
  - Distance between points
    - Distance between points on a scale should be equal

(For more information see Danielson & Abrutyn, 1997)

Types of Authentic Assessment

Portfolios

- What is a portfolio? A collection of student work over a period of time
- Provides a rich array of what students know and can do
- Provides for individual or group accountability
- Can be single-subject or interdisciplinary

(For more information see Tombari & Borich, 1999)

Types of Authentic Assessment—Portfolios

Benefits of Portfolio Use

- Show a learner's ability to think and problem solve
- Tell about a learner's persistence and effort
- Show a learner's skill in self-monitoring and ability to be self-reflective
- Can alter the nature of classroom instruction
- Means to communicate academic achievement to parents and other teachers
- Supplement regular report card grades

(For more information see Tombari & Borich, 1999)

Types of Authentic Assessment—Portfolios

What Makes a Portfolio a Portfolio?

- Developing a portfolio offers the student an opportunity to learn about learning.
- The portfolio is something that is done *by* the student, not *to* the student.
- The portfolio is separate and different from the student's cumulative folder.
- The portfolio must convey explicitly or implicitly the student's activities.
- The portfolio may serve a different purpose during the year from the purpose it serves at the end.
- A portfolio may have multiple purposes, but these may not conflict.
- The portfolio should contain information that illustrates growth.
- Finally, many of the skills and techniques that are involved in producing effective portfolios do not happen by themselves.

Types of Authentic Assessment—Portfolios

Building a System for Portfolio Assessment

Step 1: Decide on the purpose

- Monitoring student progress
- Communicating what has been learned to parents
- Evaluating how well something was taught
- Showing off what has been accomplished
- Assigning a course grade

(For more information see Tombari & Borich, 1999)

Types of Authentic Assessment—Portfolios

Building a System for Portfolio Assessment

Step 2: Identify Cognitive Skills and Dispositions

- Knowledge organization
- Cognitive strategies
  - Analysis, interpretation, organizational revising
- Procedural skills
  - Editing, drawing, speaking
- Metacognition
  - Self-monitoring, self-reflection

Types of Authentic Assessment—Portfolios

Building a System for Portfolio Assessment

Step 3: Decide who will plan the portfolio

- Teacher
- Parent
- Students
- Ideal situation involves planning from all three!

Types of Authentic Assessment—Portfolios

Building a System for Portfolio Assessment

Step 4: Choose the products and number of samples

- Ownership
  - Involve parents and students in learning
- Portfolio's link with instruction
  - Connect portfolios and learning outcomes

Types of Authentic Assessment—Portfolios

Building a System for Portfolio Assessment

Step 5: Determine the scoring rubrics

- Type of rubric: checklist, rating scale, holistic, analytic
- Rubric for each entry in the portfolio
- Scoring criteria for the portfolio as a whole product

Types of Authentic Assessment—Portfolios

Building a System for Portfolio Assessment

Step 6: Aggregate all portfolio ratings

- Learners should receive a score for each draft and final product in the portfolio
- Decide how to aggregate scores
- Develop a procedure for combining all scores

Types of Authentic Assessment—Portfolios

Building a System for Portfolio Assessment

Step 7: Determine the logistics

- What are the timelines?
- How are products turned in and returned?
- Where are final products kept?
- Who has access to the portfolio?

Types of Authentic Assessment—Portfolios

Building a System for Portfolio Assessment

Step 8: Plan a final conference

- Plan to meet with individual students
- Include parents if at all possible
- Discuss the learner's development and academic achievements

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Education Week on the Web: www.edweek.org

Educational Resources Information Center (ERIC): www.eric.ed.gov

Eisenhower National Clearinghouse: www.enc.org

International Society for Technology in Education: www.iste.org

Latest Middle Schools News and Views: www.middleweb.com

Middle School Teachers: www.westnet.com/~rickd/Teachers.html

National Association of Elementary School Principals: www.naesp.org

National Association of Secondary School Principals: www.nassp.org

North Carolina Department of Public Instruction: www.ncpublicschools.org

Ohio Middle School Association: www.ashland.edu/~omsa

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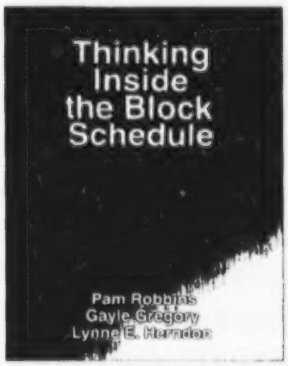

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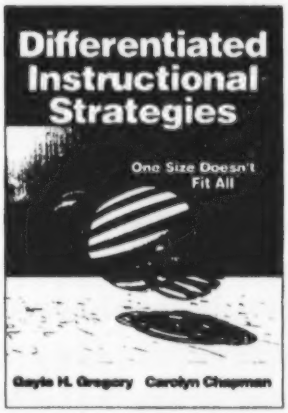

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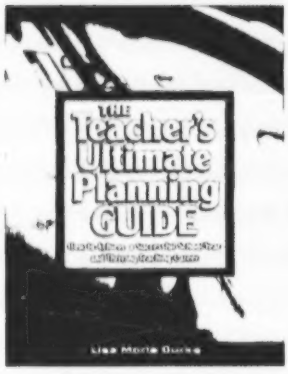

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